

**PRC Engineering**

Suite 600  
303 East Wacker Drive  
Chicago, IL 60601  
312-938-0300  
TWX 910-2215112  
Cable CONTOWENG



**Planning Research Corporation**

**Superfund Records Center**

**SITE:** Wells G+H

**BREAK:** 3.6

**OTHER:** 15993

**WELLS G AND H  
REMEDIAL INVESTIGATION  
PART II**

**FINAL REPORT**

**Prepared for**

**U.S. ENVIRONMENTAL PROTECTION AGENCY  
Office of Waste Programs Enforcement  
Washington, D.C. 20460**

Work Assignment No.	:	561
EPA Region	:	1
Site No.	:	1646 (C)
Date Prepared	:	November 1986
Contract No.	:	68-01-7037
PRC No.	:	15-5615-29
Prepared by	:	Alliance Technologies Corporation (GCA Technology Division, Inc.) (Michael O. White)
Telephone No.	:	(617) 275-5444
EPA Primary Contact	:	Barbara Newman / Gwen Ruta
Telephone No.	:	(617) 565-3643

## DISCLAIMER

This Final Report was furnished to the Planning Research Corporation for the Environmental Protection Agency by the Alliance Technologies Corporation (formerly GCA Technology Division, Inc.), Bedford, Massachusetts 01730, in partial fulfillment of Contract No. TES EMI-GCA, Task No. 069, EPA Prime Contract No. 68-01-7037, Work Assignment No. 561. The opinions, findings, and conclusions expressed are those of the author and not necessarily those of the Environmental Protection Agency or the cooperating agencies. Mention of company or product names is not to be considered as an endorsement by the Environmental Protection Agency.

## CONTENTS

Figures . . . . .	iv
Tables. . . . .	iv
Executive Summary . . . . .	v
1. Introduction. . . . .	1
Report Organization. . . . .	1
2. Site Background Information . . . . .	4
W.R. Grace & Company, Inc. . . . .	4
Wildwood Conservation Corporation. . . . .	14
Unifirst Corporation . . . . .	21
Olympia Nominee Trust. . . . .	26
3. Public Health and Environmental Concerns. . . . .	31
W.R. Grace & Company, Inc. . . . .	32
Wildwood Conservation Corporation. . . . .	32
Unifirst Corporation . . . . .	33
Olympia Nominee Trust. . . . .	33
4. Summary and Conclusions . . . . .	34
W.R. Grace & Company, Inc. . . . .	34
Wildwood Conservation Corporation. . . . .	35
Unifirst Corporation . . . . .	36
Olympia Nominee Trust. . . . .	36
References. . . . .	37
Appendices	
A. Detection Limits. . . . .	A-1
B. W.R. Grace 1985 Trench Investigation. . . . .	B-1

## FIGURES

<u>Number</u>		<u>Page</u>
1	Site Map for Wells G and H, Woburn, MA. . . . .	2
2	Site Map for W.R. Grace and Company . . . . .	5
3	Site Plan for Wildwood Conservation Corporation . . . . .	17
4	Site Plan for Unifirst Corporation. . . . .	22
5	Site Plan for Olympia Nominee Trust . . . . .	27

## TABLES

<u>Number</u>		<u>Page</u>
1	Analytical Results from 1983 Pit Excavation East of Brick Building on W.R. Grace Property . . . . .	12
2	Analytical Results of Samples Taken During 1985 Trench Investigation at W.R. Grace . . . . .	15
3	Analytical Results of Soil Samples Collected from Wildwood Conservation Corporation Property . . . . .	20
4	Analytical Results for Soil and Drum Sampling Conducted at Olympia Nominee Trust . . . . .	30

## EXECUTIVE SUMMARY

Alliance Technologies Corporation (formerly GCA Technology Division, Inc.), under subcontract to PRC Environmental Management, Inc., was directed by EPA Region I to prepare an Addendum to the original draft Remedial Investigation (RI) Report for the Wells G & H Site in Woburn, Massachusetts. The Wells G & H site final RI consists of two parts; Part I, prepared by NUS Corporation, focuses mainly on ground water contamination; and Part II (as contained herein) summarizes soil contamination at the sources identified in Part I.

The purpose of this report is to describe the nature and extent of soil contamination at the site through a review and validation of all data previously collected. The report incorporates data collected by both EPA and contractors for: W. R. Grace; Wildwood Conservation Corporation (formerly Beatrice Foods and J.J. Riley); and Unifirst Corporation and includes a description of soil contamination found at Olympia Nominee Trust (formerly Juniper Realty Trust and Hemingway Transport Corp.). Alliance did not conduct additional sampling or analysis efforts under this Work Assignment. Data presented herein was obtained through file reviews and interviews at the offices of the EPA and Massachusetts Department of Environmental Quality Engineering (MA DEQE).

Since 1979, EPA has been conducting numerous studies throughout the City of Woburn to investigate the extent and degree of contamination in the North and East Woburn areas. Studies performed by Ecology and Environment, Inc. (E & E) under contract to EPA concluded that several chlorinated organic solvents including: trichloroethene, tetrachloroethene, trans-1,2-dichloroethene, and 1,1,1-trichloroethane were found in the water from municipal Wells G & H. The E & E studies identified several general source areas for some of the contaminants detected at Wells G & H. As a result of these and subsequent studies under the direction of EPA, Administrative Orders were issued to certain facilities to investigate the nature and extent of contamination on their property. Much of the soil data presented in this report was generated as a result of enforcement actions by the EPA against three of the four subject facilities (Grace, Riley/Beatrice now Wildwood Conservation Corp. and Unifirst Corp.).

### W. R. GRACE

The W.R. Grace Cryovac facility is located approximately one third mile east-northeast of the wells G & H area. Industrial processes at the facility have required the use of several organic solvents including trichloroethene, tetrachloroethene and 1,1,1-trichloroethane. Investigations conducted during

June 1983 on the Grace property detected significant concentrations of trichloroethene, trans-1,2-dichloroethene, toluene and vinyl chloride inside drums that were disposed of in a pit on the property. The same organic compounds were found in samples collected in the general proximity of the drums, however, concentrations were substantially lower than the drum contents. A series of trenches were excavated on the property during July 1985 in an attempt to identify other "hotspots" or pockets of contamination.

During the excavation of trench number 7A, a storm drain pipe was discovered. Samples of water collected from this pipe contained trans-1,2-dichloroethene, trichloroethene, toluene as well as several other volatile organic compounds at concentrations greater than 500 parts per billion (ppb). W.R. Grace also investigated the potential contamination from the pouring of corrosives and solvent chemicals down sewer drains. A sanitary sewer pipe elbow was found to be leaking during an investigation by W. R. Grace.

Based on review of available data, Alliance has concluded that contamination that exists in the soil at the facility is likely to be contributing to ground water contamination on and moving off the Grace property.

#### WILDWOOD CONSERVATION CORPORATION

The Wildwood Conservation Corporation is the owner of an undeveloped parcel of land located directly across the Aberjona River from municipal wells G & H. The land was formerly owned by the J.J. Riley Company and the Beatrice Foods Corporation. The land was closely investigated and found to contain areas of discolored soil, rusted drums, debris piles, sludge and trash. Compounds such as trichloroethene, tetrachloroethene, trans-1,2-dichloroethene and chloroform have been found in the subsurface soils and in the ground water. Pesticides, such as chlordane and malathion, have been detected in the surface soil. The land is presently fenced and guarded to reduce unauthorized entry.

#### UNIFIRST CORPORATION

The Unifirst Corporation is located approximately one-third of a mile north-northeast of municipal wells G & H. The facility had a dry cleaning operation utilizing tetrachloroethene. The solvent was stored in an above ground tank that had at least one spill incident. Facility officials have stated that the spill was contained within the building and could not have migrated into the ground.

Tetrachloroethene contamination was found in well S6 located approximately 150 feet west of the Unifirst facility. Investigations by consultants for Unifirst were conducted to try to identify a source of tetrachloroethene contamination upgradient of the facility. However, volatile organic compounds were not detected in any of the upgradient wells. To date, there has been a very limited subsurface exploration program conducted at the Unifirst facility to determine source and extent of contamination. NUS Corporation performed an analytical screening of split spoon samples collected during the installation of monitoring well S-71 on the Unifirst property.

While the technique was not intended to quantify volatile organic compounds, it tentatively identified tetrachloroethene in soil samples collected at two foot intervals between the 0-16 foot levels at well S-71S. A more comprehensive site exploration program is required to better characterize contamination at the Unifirst facility.

#### OLYMPIA NOMINEE TRUST

Olympia Nominee Trust is the present owner of a 21 acre parcel of land located less than 600 feet north-northwest of municipal Well H. A trucking terminal is located on a thirteen acre section on the eastern side of the Aberjona River. Eight (8) acres of woodlands are located west of the Aberjona River. This site has at least two sources of contamination.

In 1983, a gasoline tank associated with the trucking terminal was found leaking. The tank was replaced with a diesel fuel tank and gasoline is no longer stored on the site. Several organic compounds including benzene, toluene, xylenes and ethyl benzene were found in water from well B-2 located downgradient of the former gasoline tank. In September 1985, EPA conducted an investigation of a report of the illegal dumping of several drums on the southwestern section of the property. Analysis of the drum contents and surrounding soil indicated high levels of contamination including polychlorinated biphenyls (at 31,000 ppm), the pesticide chlordane (51,000 ppm), volatile organics (most notably trichloroethene, tetrachloroethene, 1,1-dichloroethane and 1,1,1-trichloroethane) and several extractable organics (including 1,2,4-trichlorobenzene and 2-methyl naphthalene).

Further investigation of the undeveloped parcel of land west of the Aberjona River is necessary to assure there are no other deposits of hazardous materials or wastes that pose a threat to public health and the environment. Any other underground storage tanks at the trucking terminal portion of the property should also be inspected.

## SECTION 1

### INTRODUCTION

This report summarizes the nature and extent of soil contamination at four facilities (W. R. Grace, Wildwood Conservation Corporation, Unifirst Corporation and Olympia Nominee Trust) in the area of municipal water supply wells G & H in Woburn, Massachusetts. Data reported herein are summaries of all available information found through file reviews at the U.S. Environmental Protection Agency (EPA) Region I office in Boston and at the offices of the Massachusetts Department of Environmental Quality Engineering (DEQE) in Woburn, and in Boston, Massachusetts. Additional information was available through title searches conducted by Alliance under a separate EPA Work Assignment and from other consultants who have worked on the ground water portion of the Remedial Investigation.

This report, in conjunction with the ground water Remedial Investigation report (Part I) being prepared by NUS Corporation, will be used in the preparation of an Endangerment Assessment being conducted by Alliance Technologies Corporation (formerly GCA Technology Division, Inc.). Additionally, these data will be used in support of a Feasibility Study, to be conducted at a later date, which will examine remedial alternatives for the Wells G & H site.

### REPORT ORGANIZATION

This report is divided into four sections, the last three of which have subsections specific to the individual facilities discussed. Figure 1 presents a general map of the Wells G & H area identifying the locations of the four facilities discussed in this report in relation to Wells G & H.

Section 2 of this report presents site background information for each of the four facilities. Included in this section is information on facility size, location, historical description, types and quantities of wastes generated, waste management practices, RCRA status, RCRA enforcement history, and geological features of the site. Also included is a brief description of the environmental studies conducted at each site and a summary of the nature and extent of soil contamination at each site. Tables and maps are presented to characterize the vertical and horizontal extent of contamination at the individual sites. Types and quantities of the contaminants are discussed. Alliance and EPA Region I validated all analytical data presented in this report.



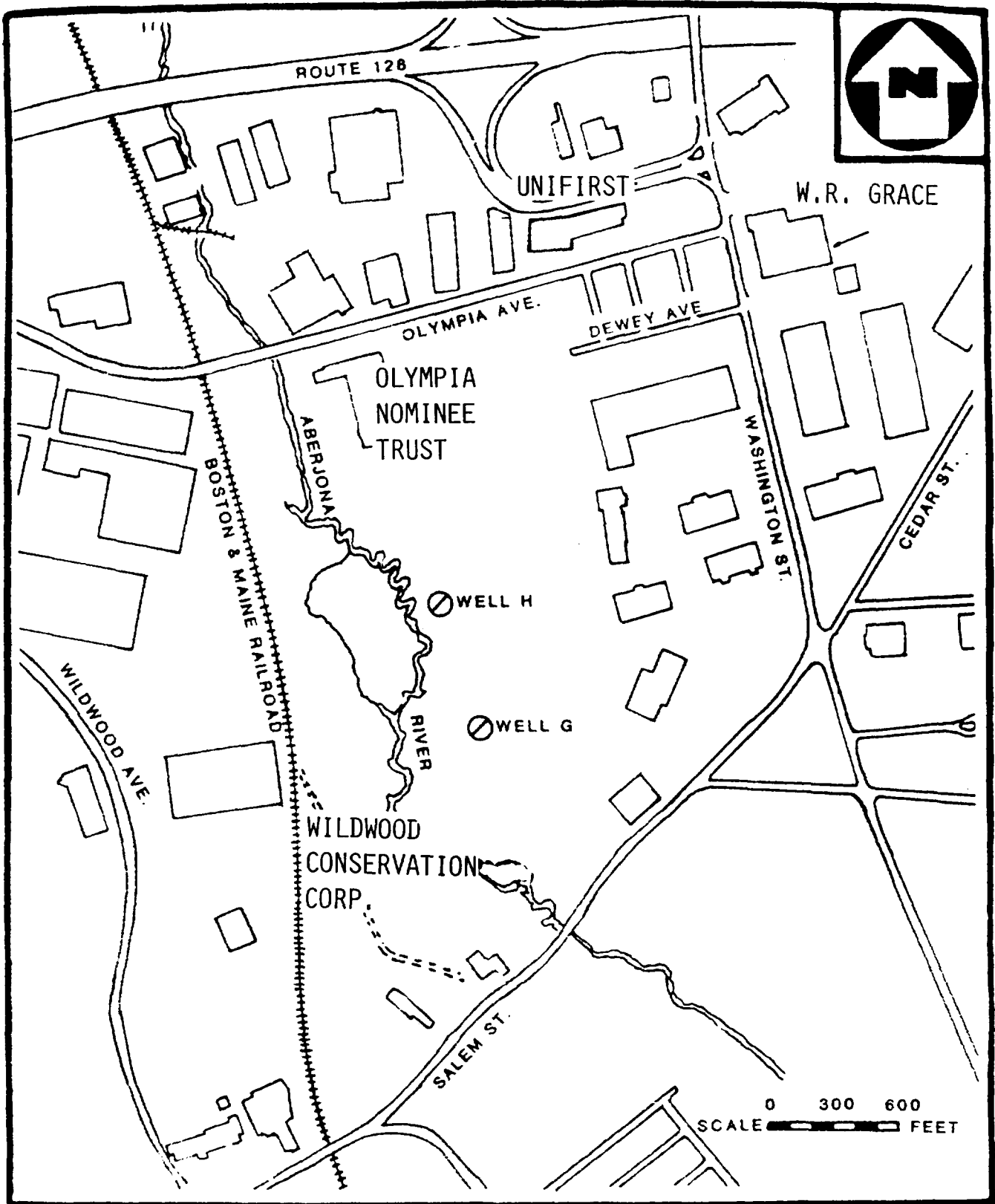


Figure 1. Site map for Wells G and H, Woburn, MA.<sup>1</sup>

Section 3 briefly discusses general public health and environmental concerns in the area. Receptors, environmental impact and accessibility to the contaminants are discussed. These topics will be discussed in much greater detail in the Endangerment Assessment.

Section 4 presents the conclusions and recommendations regarding the soil contamination. This section will summarize the major points discussed in previous sections of the report along with recommendations for follow-up efforts to be conducted under the Feasibility Study.

The Appendices include a listing of the detection limits for all samples analyzed and a copy of the report by GeoEnvironmental Consultants, Inc. providing specific descriptions of each of the excavations performed on the W. R. Grace property during July 1985.

## SECTION 2

### SITE SPECIFIC INFORMATION

This section is divided into several subsections in order to present the site background information on a facility-by-facility basis. The facility-specific information is further subdivided according to the following headings: 1) Location and History of Ownership - present facility size, figure(s) depicting the site layout, and a discussion of ownership; 2) Geological Setting - brief, general summary of site geology; 3) Wastes Generated, Waste Management Practices - description of what is done onsite, type and quantity of waste generated, and disposal practices; 4) RCRA Status - information found during file review relevant to the Resource Conservation and Recovery Act (RCRA); 5) Studies Conducted To Date - brief summary of environmental reports relevant to the site (some of this information is presented in Part I of the Remedial Investigation); and 6) Nature and Extent of Soil Contamination - tabulated results of validated sampling and analytical data for each facility.

W. R. GRACE & COMPANY, INC.

#### Location and History of Ownership

The Cryovac Division of W. R. Grace & Company, Inc. (herein referred to as W. R. Grace) is located on 12.6 acres of land at 369 Washington Street, Woburn, MA. It is situated about 1/3-mile east-northeast of the municipal water supply Wells G & H.

W. R. Grace purchased the land and buildings from the Calidyne Company, Inc. in January of 1960. Initial construction took place at the site in 1960 through 1961, at which time the facility occupied 49,000 square feet. Expansions in 1966 (22,000 additional square feet); 1969 (12,000 square feet); and 1974 (14,200 square feet) have resulted in a facility which occupies 97,200 square feet. Currently, 71,700 square feet are utilized for manufacturing, with administration (13,500 square feet) and warehouse space (12,000 square feet) accounting for the remainder.<sup>3</sup> Figure 2 depicts a topographic plan of the land as provided by GeoEnvironmental Consultants, Inc.,<sup>4</sup> consultants for W. R. Grace, with modifications added by Alliance Technologies Corporation.

In the summer of 1974, W. R. Grace hired Donald M. Manzelli, Inc. to construct an addition to the north side of the existing facility. Incident to the construction, a pit was dug and used to bury construction debris as part of the general site cleanup. The location of the pit was estimated to be approximately 100 feet behind (east of) the plant building, approximately 200



to 300 feet from the north and south boundaries of the property, and some 500 feet from the east boundary of the property. It was later reported by W. R. Grace that a quantity of hazardous waste was included with the construction debris that was disposed of in this pit. W. R. Grace estimated that between 10 to 15 filled or partially filled drums of accumulated paint sludge\* were emptied into the pit in the belief that the paint sludge was generally innocuous in nature.<sup>3</sup>

In a response to a Request for Information pursuant to Section 3007 of the Resource Conservation and Recovery Act (3007 Letter)<sup>5</sup>, Donald M. Manzelli stated that his firm dug a pit on the W. R. Grace property between July and October of 1974. The pit was used for disposal of debris and paint fragments. Mr. Manzelli had no recollection of any containers being buried there.

An investigation of the pit was conducted pursuant to an Administrative Order (AO) issued by EPA under the authority of Section 3013 of the Resource Conservation and Recovery Act (RCRA) during May of 1983.<sup>6</sup> Details of the AO are further described later in this subsection.

### Site Geology

The W. R. Grace site is underlain by unconsolidated deposits consisting of glacial deposits and recent marsh and alluvium. These deposits overlie granodiorite which occurs at depths of 19 to 63 feet. Bedrock cores from the area indicate that this rock is slightly to moderately fractured. The bedrock surface at the site appears to be somewhat undulatory. Based on existing boring logs, there appears to be a depression in the area of Well GW22, and a northeast to southwest trending bedrock trough across a portion of the site.

Based on an evaluation of subsurface exploration and formation permeability testing at the site, coefficients of permeability are estimated to be on the order of less than 0.03 to as much as 10 feet/day. A conservative composite of horizontal and vertical shallow flow components for the southwest side of the W. R. Grace property at 1.5 feet/day.<sup>8</sup>

### Waste Management Practices

Since its initial construction in 1960, this facility has been engaged in the metal fabrication of packaging equipment for vacuum packing and plastic wrapping in the food industry. Most of the fabrication involves use of stainless steel to meet the rigid health and safety specifications of the food industry.<sup>3</sup>

---

\*Paint sludge is generated from the painting of certain parts of equipment that are manufactured at W. R. Grace. Painting is done in a spray booth with a water wash wall designed to capture fugitive paint spray air emissions. The water wash is a closed-loop system that recirculates the water for long periods of time. The paint dries in the sump of the system which is periodically cleaned of paint accumulation.<sup>3</sup>

The company generates waste in the form of machine coolants, water soluble oils, paint thinners, paint sludge, and waste oils. It is estimated that the facility generates 90 gallons/month of ignitable wastes and 55 gallons/month corrosive wastes.<sup>7</sup>

In the course of its manufacturing activities W. R. Grace has utilized chlorinated solvents. These solvents are associated with the cleaning, painting, and laminating of machinery parts. Trichloroethene, toluene, and acetone were used in small quantities in the 1970's.<sup>3</sup> W. R. Grace also uses cutting fluids of the type customarily utilized in machine shops. The cutting fluid presently used contains 1,1,1-trichloroethane in concentrations of less than 1 percent by volume. Spent cutting fluids are accumulated in 55-gallon drums for disposal at a RCRA authorized facility, as are paint sludge and related paint equipment cleaning materials.<sup>1</sup>

W. R. Grace has also acknowledged the use of the pit east of the main building for occasional deposition of waste behind the plant in the undeveloped area between drainage ditches on the north and south side of the property and periodic discharge of waste into the city sewer system.<sup>7</sup>

#### RCRA Status

The W. R. Grace, Woburn facility is classified as a small quantity generator by the Massachusetts Department of Environmental Quality Engineering (MA DEQE), as it accumulates (stores) less than 1,000 kg of waste at any one time. The latest RCRA inspection report located during the file review at the DEQE offices was for 1983<sup>7</sup>. The inspections conducted in August and September of 1983 resulted in a Notice of Violation for accumulating more than 1,000 kg of waste at one time. This was viewed as a misunderstanding of the regulations by W. R. Grace and assurances were made that steps would be taken to increase the frequency of their hazardous waste shipments.

On May 9, 1983, EPA Region I issued an Administrative Order (Docket No. 83-1008) pursuant to 3013 of RCRA to W. R. Grace requesting the preparation and submission of a plan for the identification, sampling, analysis and monitoring of any hazardous wastes that may have been present at the site. The Order called for a phased approach for assessing contamination on the property. Work conducted to date under the Order is summarized in the following subsection.

#### Studies Conducted

Under the requirements of the Administrative Order dated May 9, 1983, W. R. Grace hired an environmental consultant to assist in evaluating the extent and degree of contamination on or emanating from their property. Work

was conducted in a phased approach and technical reports and summaries resulted. Phases I through III were conducted as a direct result of the order, Phases IV through VI were conducted later by Grace under their own initiative. Each of the technical reports are discussed in general below, with a discussion and presentation of relevant data appearing later in this section.

W. R. GRACE & COMPANY CRYOVAC DIVISION, WOBURN PLANT, FIELD  
INVESTIGATIONS AND REMEDIAL MEASURES, PHASES I-III, FINAL REPORT.  
Prepared by GeoEnvironmental Consultants, Inc., White Plains, N.Y.,  
May 1984--<sup>9</sup>

This report presented a summary of the Phase I geophysical surveys undertaken in April 1983; Phase II test borings (installation of 14 monitoring wells at seven onsite locations and well sampling); and Phase III (the controlled excavation, sampling and removal of material from the pit area east of the Cryovac facility during June 1983).

The geophysical surveys conducted during the Phase I study were intended to pinpoint the location of buried metal objects on the site (buried drums being of particular concern) and to determine the depth-to-bedrock variations throughout the site. The location of buried metal objects was determined by conducting a magnetic survey of the site, and depth-to-bedrock variations were determined using earth resistivity techniques. These surveys were conducted in April 1983. The magnetic survey indicated two strongly magnetic zones in the central portion of the site east of the plant. One zone corresponded to the pit area east of the manufacturing building, and the other was approximately 25 to 40 feet southwest of the pit area. Magnetic sources in both zones appeared to be within 10 feet of the ground surface. Information obtained from the earth resistivity surveys indicated the presence of a bedrock ridge beneath the site. The ridge appeared to extend from the north, terminating east of the main plant building, and approximating the regional topography. Resistivity soundings estimated bedrock to be from 10 to 62 feet below ground surface. These findings were significantly revised after evaluation of well boring information taken during Phase II.

Phase II featured the installation and sampling of 14 wells at seven locations. Each location typically consisted of one well screened in overburden and another well screened in the first 20 feet of bedrock. Information regarding well locations is further presented in Part I of this Remedial Investigation. Data collected from the soil analyses are presented later in this section.

Phase III was the controlled excavation on the east side of the main building. During the period June 13-15, 1983, the former pit area east of the plant underwent controlled excavations. Digging was accomplished by means of a track backhoe and hand shovels. The excavation covered an area approximately 10 ft x 30 ft, and was approximately 11.5 ft deep at its deepest. Six drums were excavated on June 14, 1983 at the W. R. Grace property. Two of the drums were filled 75 percent of capacity with liquid. Two of the drums contained several inches of paint sludge. The remaining two drums were found crushed with only residual liquid.

The trench was excavated until undisturbed material was exposed along all side walls, as well as at the bottom of the trench. Ground water and hard digging conditions were encountered. As soil was removed from the excavation it was screened with a photoionization detector (PID). Material sustaining a reading higher than 1 ppm for 20 seconds was placed in the bermed area. In addition to the drums, approximately 5 cubic yards of construction debris and plant refuse was also excavated. Of approximately 90 cubic yards of materials excavated, 15 yards were considered contaminated. Samples for analysis were collected from the trench soil/sludge, trench water and the two drums containing liquids. Upon completion of all excavation activities, monitoring well (G-6) was installed in the trench.

The report concluded that volatile organic compounds were found at the pit excavation area, where buried drums were discovered and within the ground water flow system along the southern portion of the site. The area of highest contamination (drums and contaminated soil) has been removed and the area is presently being monitored. The report also concluded that additional studies are required to better define the depth and areal extent of the ground water contamination plume.

TRIP REPORT: EXCAVATION AT W. R. GRACE & COMPANY, WOBURN, MA. Prepared by NUS Corporation for the Project File, TDD No. F1-0300-01, June 21, 1983--10

This trip report summarizes the NUS Corp. oversight activities conducted during the June 1983 pit excavation at W. R. Grace. A description of sampling conducted at the site was provided. A brief listing of the organic vapor analyzer measurements taken at various locations was provided. A total of five split-samples were collected by NUS and submitted for analysis. The analytical results of these samples are provided later in this section.

W. R. GRACE & COMPANY, CRYOVAC DIVISION, WOBURN PLANT FIELD  
INVESTIGATIONS AND REMEDIAL MEASURES, PHASE VI - FIELD DESCRIPTIONS,  
GeoEnvironmental Consultants, Inc., White Plains, NY, August 1985--11

This report provides a description of the 31 exploratory trenches or pits that were excavated at the W. R. Grace property during July 1-4, 1985. The purpose of the excavations was to complete Phase VI of the Remedial Investigation Work Plan, dated June 25, 1985. Trench descriptions and pertinent findings are described in the report.

Descriptions of the trenches at which contaminants were found are summarized below. Complete trench descriptions, as given in the report by GeoEnvironmental are provided in Appendix B of this report. Trench locations are shown in Figure 2. Validated analytical results are presented in Table 2.

- Trench 7: 40 ft x 3.5 ft x 6 ft, initiated at north wall of warehouse adjacent to concrete apron. A sample was collected of a hard, brittle gray-green paint sludge between 1.0 to 1.5 ft at



mid-trench. At a depth of 4.5 to 6.0 ft in the mid-trench area, a section of drainage pipe was encountered. Detector tubes for trichloroethene indicated concentrations of 35 ppm, with OVA readings of 710 ppm. Soil and water samples were collected from within the pipe. A small amount of yellow paint sludge was encountered in the area of the drainage pipe. Trench 7A was developed in an attempt to follow the path of the drainage pipe.

- Trench 7A: 15 ft x 4.5 ft x 10.5 ft extending from the middle of trench 7 away from the brick building. At depths between 1.0 to 3.0 ft the OVA readings went offscale, indicating high concentrations. Detector tubes indicated 35 ppm aromatic hydrocarbons and 200 to 400 ppm toluene. Samples of paint sludge found at levels 3 to 4 ft deep were collected. Water seepage was noted at 8.5 ft and thought to possibly be contaminated from water and sludge from the drainage pipe.
- Trench 14: 50 ft x 5 ft x 9.5 ft, initiated 10 feet of warehouse transecting trenches 6, 7, 8 and 9. At the depth of 4 to 5 feet gray-black granular soil with green discoloration and paint sludge was noted. Organic vapor analyzer readings at this depth exceeded 100 ppm. At depths of 6 to 9.5 feet gray-black sludge like material with asphaltic appearance was encountered. Water seepage was noted at 9.5 feet.
- Trench 25: 8 ft x 4 ft x 10 ft. Located near fence northwest of warehouse building. Aromatic odor noted at depths of 4 to 7 feet water seepage was noted at 7.5 feet. Schedule 40 PVC pipe was positioned in the trench and later designated as well 6A.

Analytical results for samples collected and maps depicting trench locations were included. This report provided field descriptions only. No attempts were made by GeoEnvironmental Consultants, Inc. to develop any conclusions.

DATA REPORT: EXCAVATION AT THE W. R. GRACE SITE, WOBURN, MA. Prepared by NUS Corporation for EPA Region I, TDD No. F1-8506-02, May 9, 1986--12

NUS provided technical oversight during trench excavations at the W. R. Grace property during July 1985. This submittal contained results of volatile organic analyses conducted on a total of 12 split samples collected during the excavations. A brief description of the samples collected (trench number and depth) were provided. Analytical results from splits collected by NUS as well as results reported by GeoEnvironmental Consultants, are presented in Table 2.

TRIP REPORT: TECHNICAL OVERSIGHT AT THE W. R. GRACE SITE, WOBURN, MA. Prepared by NUS Corporation for EPA Region I, TDD No. F1-8506-02, January 26, 1986--13

Technical oversight was provided by NUS Corporation during monitoring well installation on the W. R. Grace property from September 14 to October 23, 1985. Drilling was performed by Con-Tec (a contractor for

GeoEnvironmental Consultants) under the supervision of EPA, NUS and Weston Geophysical. A total of 34 wells were installed at sixteen locations (numbers 13 through 38). NUS performed field screenings on split spoon samples collected during the well installation. The field screening technique is used to tentatively identify the presence of volatile organic contamination. The field screening results are summarized below:

- Location 13 - one unidentified component from 12 to 21 feet.
- Locations 14 and 15 - presence of contamination tentatively identified as trichloroethene in all samples collected from 0 to 22 feet.
- Location 16 - none detected 0 to 26 feet.
- Location 17 - contamination detected at 4 to 8 and 10 to 14 feet.
- Location 18 - none detected 1 to 18 feet.
- Location 19 - not observed by NUS.
- Location 20 - presence of contamination tentatively identified as trichloroethene in samples collected from 2 to 15 feet.
- Location 21 - none detected at 10 to 26 feet.
- Location 22 and 27 - no field screening.
- Location 23 - one unidentified compound found in samples collected from 6 to 9 feet.
- Location 24 - none detected at 0 to 26 feet.
- Location 25 - presence of contamination tentatively identified as trichloroethene from 2 to 12 and 14 to 22 feet.
- Location 26 - unidentified compounds detected in samples collected at 8 to 10 and 14 to 16 feet.
- Location 28 - presence of contamination tentatively identified as trichloroethene in samples collected at 8 to 10 and 16 to 22 feet.

#### Nature and Extent of Soil Contamination

Table 1 presents a summary of analytical results of samples taken during pit excavation activities at the area east of the brick building on the W. R. Grace property during June 1983. At that time three test pits were excavated in search of buried objects. Soil and water samples were collected by GeoEnvironmental Consultants (consultants for W. R. Grace) and a split sample was provided to NUS Corporation (consultants for EPA) for duplicate analysis. Data presented in Table 1 include results of liquid samples obtained from two of the six drums located during the excavation.

TABLE 1. ANALYTICAL RESULTS FROM 1983 PIT EXCAVATION EAST OF BRICK BUILDING ON W.R. GRACE PROPERTY

Sampling date: Sample location: <sup>a</sup> Units: Reported by:	6-14-83		6-14-83		6-15-83		6-15-83	
	Pit water µg/L (ppb) Grace	NUS	Pit soil µg/kg (ppb) Grace	NUS	Drum #1 µg/L (ppb) Grace	NUS	Drum #6 µg/L (ppb) Grace	NUS
<b>Volatile Organics (ppb)</b>								
Ethylbenzene	81 J <sup>b</sup>	36 J	--	--	849 J	3,500 J	293 J	1,030 J
Methylene Chloride	11 J	224 J	1960 J	28	4,510 J	4,287 J	123 J	173 J
Toluene	-- <sup>b</sup>	--	--	10	25,900 J	22,200 J	127 J	38,764 J
Trans-1,2-Dichloroethene	<10 J	--	--	--	9,830 J	8,230 J	360 J	272 J
Trichloroethene	<10 J	--	--	--	105,000 J	170,200 J	126 J	152 J
Trichlorofluoromethane	24 J	--	<50 J	--	--	--	<10	--
Vinyl Chloride	<10 J	--	--	--	1,080 J	859 J	<10	--
Chloroform	--	--	--	<10 J	--	48 J	--	--
Acetone	<sup>b</sup>	--	--	--	--	83,197 J	--	1,399 J
2-hexanone	26	26	--	--	352,200 J	--	--	--
4-ethyl-2 pentanone	22	22	--	--	260,400 J	--	--	1,070 J
O-xylene	148	148	--	--	6,790 J	--	--	3,460 J
2-butanone	--	--	--	--	5,820 J	--	--	--
Carbon Disulfide	--	--	--	--	289 J	--	--	--
Styrene	--	--	--	--	--	--	--	134 J
<b>Acid Compounds</b>								
Benzoic Acid	R <sup>b</sup>	--	--	--	--	1,000 J	--	<100
2,4-dimethyl phenol	R	--	R	--	--	--	R	27 J
phenol	--	--	R	--	--	--	R	10 J
2-methyl phenol	--	--	--	--	--	--	--	56 J
4-methyl phenol	--	--	--	--	--	--	--	26 J
<b>Base/Neutral Compounds</b>								
Isophorone	R	--	R	--	--	--	R	--
Napthalene	R	100 J	R	--	--	170 J	R	63 J
2-methylnapthalene	R	142 J	R	--	--	--	R	--
di-n-butyl phthalate	R	581 J	R	224	--	498 J	R	--
Bis (2-ethylhexyl) phthalate	--	R	--	R	--	--	--	R
Benzyol Alcohol	R	--	R	--	--	200 J	R	--
<b>Pesticides Compounds</b>								
Pesticides Compounds	R	--	R	--	--	--	R	--

(continued)

TABLE 1 (Continued)

Sampling date:	6-14-83	6-15-83	6-15-83	6-15-83	6-15-83
Sample location: <sup>a</sup>	Pit water	Pit soil	Drum #1	Drum #6	
Units:	µg/L (ppb)	µg/kg (ppb)	µg/L (ppb)	µg/L (ppb)	
Reported by:	Grace NUS	Grace NUS	Grace NUS	Grace NUS	NUS
Metals, Cyanides, Penols					
Arsenic	R	10	15	16	16
Chromium	R	--	10	--	--
Copper	R	--	20	--	--
Nickel	R	--	11	--	130
Zinc	R	57	64	12,900	369,000
Aluminum	R	5,490	4,980	11,700	11,400
Barium	R	--	23	120	230
Beryllium	R	--	0.3	--	6
Cobalt	R	--	4.7	160	360
Iron	R	7,570	9,290	21,700	23,000
Manganese	R	530	110	430	4,170
Boron	R	--	--	--	--
Vanadium	R	--	17	--	--
Silver	R	--	--	--	--
Antimony	R	--	--	--	--
Selenium	R	--	--	--	--
Thallium	R	--	--	--	--
Mercury	R	0.2	--	--	1.5
Tin	R	--	--	52	--
Cadmium	R	--	--	1.2	14
Lead	R	9	4.3	180	710
Cyanide, Total	R				
Phenols, Total	R				

<sup>a</sup> - Depth at which samples were collected was not specified.

<sup>b</sup> - Analytical data key.

J - Quantitation is approximate due to quality control review (data validation).

-- - Indicates compound was not detected.

R - Value is rejected due to quality control review (data validation).

Blank Space - Not Analyzed.

Detection Limits provided in Appendix B.

Table 2 is a summary of the analytical results of samples taken during the July 1985 trench excavations. Trench locations are identified in Figure 2 and Appendix B. Sample splits were collected by NUS Corporation for EPA Region I. Analytical results of samples collected and analyzed by consultants for W. R. Grace were validated by Alliance Technologies Corporation prior to their presentation in this report.

## WILDWOOD CONSERVATION CORPORATION

### Location and History of Ownership

The Wildwood Conservation Corporation (WCC) is the current owner of the undeveloped 15 acre parcel of land west of Wells G & H. This parcel of land is bounded by the Boston & Maine Railroad on the west, the Aberjona River on the east, Olympia Nominee Trust on the north, and three commercial properties to the south (Whitney Barrel Company, Aberjona Auto Parts Company, and Murphy Waste Oil Service Company). The three commercial properties each have frontage along Salem Road in Woburn, MA. The Wildwood Conservation Corporation site (herein referred to as the Wildwood site) is primarily undeveloped except for a production well that has been the primary source of process water for the J.J. Riley Tannery. Figure 3 presents a site plan for the Wildwood Conservation Corporation property.<sup>1</sup>

The Wildwood site was formerly owned by the John J. Riley Company and by Beatrice Foods, Inc. of Chicago, Illinois. Beatrice Foods, Inc. purchased the tannery and the undeveloped parcel of land from the John J. Riley Company in December 1978. Wildwood Conservation Corporation (with John Riley as president) acquired the undeveloped parcel of land from Beatrice Foods by a deed dated June 1, 1983. The tannery was sold back to J.J. Riley in 1983. The tannery was sold to its employees in 1985, but still retains the original company name, John J. Riley Company.

In May of 1983, EPA issued an Administrative Order to the owners of the undeveloped parcel of land, Beatrice Foods, under the authority of Section 3013 of the Resource Conservation and Recovery Act, to investigate the contamination on the property.<sup>14</sup> On December 12, 1985, EPA under the authority of Section 106 of the Comprehensive Environmental Response Compensation and Liability Act (CERCLA), issued an Administrative Order to Wildwood Conservation Corporation (Docket No. I-86-1011) requiring a fence and a guard in order to prevent unwarranted entry to the property.<sup>15</sup>

### Site Geology<sup>16</sup>

The Wildwood Conservation Corporation Site is located in the valley flat of the Aberjona River Valley. The Aberjona River bedrock valley has been filled with glacial outwash, glacial till and recent alluvial sediments consisting of unconsolidated silt, sand and gravel. The total thickness of these deposits ranges from approximately 30 feet at mid-property near the B&M railroad tracks, to 100 feet or more near the northern, eastern and southern property boundaries.

TABLE 2. ANALYTICAL RESULTS OF SAMPLES TAKEN DURING 1985 TRENCH INVESTIGATION AT W.R. GRACE, (ppb). \*

Date	7/1/85	7/1/85	7/1/85	7/1/85	7/1/85	7/1/85	7/1/85	7/1/85	7/1/85	7/1/85
Trench #	6	7A	7A	7A	7	7	7	7	7	7
Depth	7.5 ft	0.3-2 ft	10 ft	5 - 6 ft.	5 - 6 ft.	5 - 6 ft.	5 - 6 ft.	5 - 6 ft.	5 - 6 ft.	4-6 ft
Matrix	Water	Sludge	Water	Green Sludge	Soil	Soil	Soil	Soil	Soil	Soil
Reported By	NUS	Grace	Grace	NUS	Grace	Grace	Grace	Grace	Grace	Grace
Sample #	13352	J0133	J0454	13356	13355	J0453	J0135	J0140	J0139	J0137
Vinyl Chloride	--	--	1,598 J	1,500	--	--	41 J	460 J	R	R
Methylene Chloride	R	131 J	--	R	--	132 J	--	--	R	R
1,1-Dichloroethene	--	--	20 J	--	--	--	--	--	R	R
Trans-1,2-dichloroethene	--	--	6,017 J	8,400	--	--	--	--	R	R
Trichloroethene	--	--	4,200 J	3,200	--	--	--	--	R	R
Tetrachloroethene	--	--	259 J	520	--	--	--	--	R	R
1,1,1-Trichloroethane	--	--	4	--	--	42 J	31 J	--	R	R
Toluene	--	--	6,784 J	12,000	570	59 J	<30 J	--	R	R
Chlorobenzene	--	--	--	--	--	--	--	--	R	R
Ethylbenzene	--	--	482 J	600	44	--	--	--	R	R
Styrene	--	--	--	--	--	--	--	--	R	R
Total Xylene	--	--	--	1,500	39	--	--	--	R	R
bis(2-ethylhexyl)phthalate	R	R	--	--	--	--	--	--	2,330 J	2,130 J
Napthalene	--	--	--	--	--	--	--	--	1,460 J	2,180 J
Vinyl Chloride	41 J	50	--	--	--	--	--	--	R	--
Methylene Chloride	--	R	<14 J	R	18 J	17 J	--	158 J	R	350
1,1-Dichloroethene	--	--	--	--	--	--	--	--	R	--
Trans-1,2-dichloroethene	532 J	760	--	--	--	--	--	--	R	--
Trichloroethene	29 J	29	<9.5 J	--	--	--	--	--	R	--
Tetrachloroethene	--	--	--	--	--	--	--	21 J	R	--
1,1,1-Trichloroethane	--	--	--	--	--	--	--	43 J	R	--
Toluene	240 J	430	--	--	--	--	--	--	R	--
Chlorobenzene	--	--	--	--	--	--	37 J	--	R	--
Ethylbenzene	--	25	--	--	--	--	--	--	R	--
Styrene	--	--	--	--	--	--	--	--	R	--
Total Xylene	--	25	--	--	--	--	--	--	R	40
bis(2-ethylhexyl)phthalate	R	--	--	--	--	--	--	--	--	--
Napthalene	R	--	--	--	--	--	--	--	--	17,000

\* All values are reported in parts per billion (ppb), which is equal to micrograms per liter (ug/L) for water samples and micrograms per kilogram (ug/kg) for soils and sludges.

-- Not Detected at a limit of 10 ppb. Detection Limits are provided in Appendix A

J Value considered to be an approximate.

Blank Space indicates that compound was not analyzed for.

R Value was Rejected during Quality Control review by GCA or EPA. Other results not presented because they did not meet EPA Protocol.

TABLE 2. (Continued)

[illegible]

\* All values are reported in parts per billion (ppb), which is equal to micrograms per liter ( $\mu\text{g/L}$ ) for water samples and micrograms per kilogram ( $\mu\text{g/kg}$ ) for soils and sludges.

Not Detected at a limit of 10 ppb. Detection Limits are provided in Appendix A

Value considered to be an approximate.

Blank Space indicates that compound was not analyzed for.

R Value was Rejected during Quality Control review by GCA or EPA. Other results not presented because they did not meet EPA Protocol.





Woodward-Clyde Consultants (a contractor for Beatrice/Riley) has determined that the upper part of the unconsolidated deposits are comprised of well-sorted sands with an estimated hydraulic conductivity of 0.013 cm/sec; a layer of sandy gravel underlies the well-sorted sands and occurs at depths ranging from 25 to 50 feet. The hydraulic conductivity of the sandy gravel layer has been estimated at 0.025 cm/sec.

Ground water recharge is mainly from infiltration of precipitation. Piezometric head data obtained from nested wells in this area indicates a downward vertical component of ground water flow in the uplands on the east side of the Aberjona River and an upward component of flow in the vicinity of the Aberjona River wetlands in this area.

#### Waste Management Practices

The Wildwood Conservation Corporation does not handle or generate hazardous waste. There is a production well located on the property used by the J. J. Riley Tannery.

#### RCRA Status

The parcel of land owned by the Wildwood Conservation Corporation is not a RCRA regulated facility.

#### Studies Conducted

Under the requirements of an Administrative Order issued to Beatrice by EPA Region I during May 1983, several studies were conducted on the property now owned by the Wildwood Conservation Corporation. (The Administrative Order issued to Wildwood Conservation Corporation in 1985 was to secure the site as a result of information obtained during these studies).

GEOHYDROLOGY AND GROUND WATER CONTAMINATION, J.J. RILEY SITE, WOBURN, MA. Prepared for Lowenstein, Sandler & Associates, Roseland, NJ. Prepared by Woodward-Clyde Consultants, Wayne, NJ. January 31, 1984<sup>15</sup>

Woodward-Clyde Consultants (WCC) was retained to develop a work plan to assess the geohydrology and ground water contamination at the Riley (Wildwood Conservation Corporation, WCC) property, and subsequently to conduct the investigation. The purpose of the study was to estimate the background water quality, to estimate the probable source of contaminated ground water, and to determine whether past uncontrolled dumping on this property contributed significantly to the degradation of ground water quality. Eleven monitoring wells were installed at eight sites at depths ranging from 14 to 44 feet at preselected locations as determined after a subsurface boring and soil conductivity survey.

The report provided information on the pumping at the Riley No. 2 production well. It reported the typical pump rate of the production well was approximately 325 gallons/minute. The Woodward-Clyde data suggested that the Riley well captures at a minimum, ground water from much of the site, the Aberjona River, the Murphy Waste Oil Service Company, the Whitney Barrel Company property, and the Aberjona Auto

Salvage Yard property. At times when the well is not pumping, ground water flow at the site resumes a southeasterly direction down the Aberjona Valley.

The report concluded there was no evidence of widespread disposal at the site or in the near surface soils. Samples of suspect soils were found to contain no substantial volatile organic compounds. The near surface contamination found in a sample collected near the Barrel Company/Riley property line contained the highest reported concentration of trichloroethene (approximately 10 feet south of well W-3) of any of the soil samples collected during the Woodward-Clyde investigation.

Woodward-Clyde concluded that this level of contamination is more indicative of soil conditions at the Whitney Barrel Company than at the Riley property. The report also concluded that although surface soils on the Riley (WCC) site probably were contaminated in the past, the contamination did not lead to significant contamination of the Aberjona River Valley sediments beyond the Riley site.

PHASE II GROUND WATER INVESTIGATION, J.J. RILEY SITE, WOBURN, MA.  
Prepared for Lowenstein, Sandler & Associates, Roseland, NJ. Prepared by Woodward-Clyde Consultants, Wayne, NJ. November 1, 1984.<sup>17</sup>

This study was initiated to acquire additional data to support the conclusions made in the previous report. This study included the installation of four additional monitoring wells, the collection of additional surface soil samples, collection and analysis of a set of ground water samples from all the wells, and performance of an aquifer test. This additional data in combination with existing data would be used to characterize: the upgradient ground water quality; ground water flow and direction; hydraulic properties of the aquifer and the probable sources of ground water contamination, particularly in the northern end of the property.

The report concluded that under production well pumping conditions, the flow of ground water is towards the production well. Data from the aquifer test supported the WWC hypothesis that the Aberjona River and its swamps are recharge boundaries. The report also concluded that ground water contamination at the Riley site is likely due to onsite and unnamed offsite sources.

#### Nature and Extent of Soil Contamination

Table 3 presents the available results of samples taken during the installation of monitoring well BW-13. Also included are chemical and analytical results from the thirteen soil samples collected with hand augers by Weston Geophysical and analyzed by ERCO for Woodward-Clyde Consultants in 1985. Approximate sampling locations are plotted on Figure 3, based upon the Riley Site Activity Map developed by Weston Geophysical Corp.<sup>18</sup> A substantial amount of contamination exists at this site. The land has been closely investigated by Weston Geophysical Corporation, detailing areas of known or suspected contamination. Areas of discolored soil, rusted 55-gallon drums, debris piles, paint cans, tarry sludge and trash have been identified.

TABLE 3. ANALYTICAL RESULTS OF SOIL SAMPLES COLLECTED FROM WILDWOOD CONSERVATION CORPORATION PROPERTY (ppb)

Date	8/7/85	8/7/85	8/7/85	8/7/85	8/7/85	8/12/85	8/12/85	8/12/85
Location	A3	A4	A4	A5	A10	A11	A13	A13
Depth	20-24"	26-36"	36"	32-40"	32-40"	40-48"	8-16"	8-16"
Sample ID No.	18985	18986	18987	18989	19123	19124	19127	19125
trans-1,2-Dichloroethene	170 J	3,600 J	3,600 J	2,700 J	--	--	--	--
Chloroform	--	420 J	98 J	830 J	--	--	--	--
1,1,1-Trichloroethane	--	1 J	1 J	1 J	--	--	--	--
Trichloroethane	100 J	7,000 J	11,000 J	22,000 J	--	--	--	--
Tetrachloroethene	1 J	2,800 J	2,400 J	130,000 J	--	--	--	--
Chlorobenzene	--	--	--	--	--	--	--	--
Total Xylenes	--	--	--	--	--	--	--	--
Ethylbenzene	--	--	--	--	--	--	--	--
Chlordane	--	--	--	--	--	--	--	--
Malathion	--	--	--	--	--	--	--	--
Date	8/12/85	8/10/85	8/12/85	8/12/85	10/18/85	10/18/85	10/18/85	10/18/85
Location	A14	A16	A18	A19	NW13-1	NW13-1	NW13-2	NW13-2
Depth	16-24"	0-4"	0-8"	32-40"	0-2'	0-2'	2-4'	2-4'
Sample ID No.	19126	19128	19129	19130	22414	22414	22415	22415
trans-1,2-Dichloroethene	--	--	--	--	--	--	--	--
Chloroform	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	--	--	--	--	--	--	--	--
Trichloroethane	--	--	--	--	9,800 J	9,800 J	89,000 J	89,000 J
Tetrachloroethene	--	--	--	--	--	--	--	--
Chlorobenzene	--	--	--	--	--	--	--	--
Total Xylenes	--	--	--	--	--	--	--	--
Ethylbenzene	--	--	--	--	--	--	--	--
Chlordane	--	9,300 J	--	--	--	--	--	--
Malathion	--	100 J	--	--	--	--	--	--

All values are reported in parts per billion which is equal to micrograms per kilogram.

-- Not Detected at a limit of 1 ppb. Detection limits are provided in Appendix A.

J Value considered to be an approximate.

Blank space indicates that compound was not analyzed for.

Samples collected by Weston Geophysical and sample splits were provided to Woodward-Clyde Consultants and analyzed by ERCO.

Split spoon samples (SS-) were collected at 2 foot intervals during well installation (reported by Woodward-Clyde Consultants).

## UNIFIRST CORPORATION

### Location and History of Ownership

This facility is located at 15 Olympia Avenue in Woburn, Massachusetts. The property is presently owned by the Croatti Family Partnership. Aldo Croatti is president of Unifirst Corporation. Unifirst Corporation is leasing the property from the Croatti Family Partnership. B&S Realty acquired the property from a variety of sources during 1965 and 1966, and passed it on intact to the Croatti Partnership through Interstate Uniform Service Corporation (IUSC) Realty in 1983.<sup>2</sup>

In 1965, B&S Realty (a corporation formed prior to IUSC), purchased and developed the original 134,400 square foot parcel of land at 15 Olympia Avenue. Prior to 1965 this area was an empty lot. Figure 4 is a site plan for the Unifirst facility. Development of this parcel included construction of Building A (see Figure 4), which was used for garment storage and office space. In May 1966, a permit was obtained for a 24,000 square foot addition (Building B) that was used for the processing and storage of industrial uniforms and dry cleaning. In 1977, IUSC purchased additional property along the western side of Building A. This property was paved and used for parking. In 1978, IUSC constructed a 6,120 square foot addition (known as Building C) to the front of Building A to expand and upgrade the office facilities, as well as provide a new truck storage garage.<sup>19</sup>

On May 9, 1983, an Administrative Order pursuant to Section 3013 of RCRA was issued by EPA to Interstate Uniform Service Corporation (Docket No. 83-1006) in May 1983.<sup>20</sup> This Order called for a Site Assessment report and a ground water monitoring program to be initiated. The monitoring program called for the investigation of the ground water upgradient of the facility to provide evidence of a source of ground water contamination upgradient of the Unifirst facility.

### Site Geology

At the Unifirst facility, fill is encountered at the surface in several areas that may be as much as 10 feet thick. The fill is underlain by fine to medium sand, silt and gravel of glacial origin that ranges from 5 to 20 feet thick based on boring logs from the area. In some locations, till underlies the sand and gravel deposits. Where present, the till may be as thick as 82 feet; however, it is totally absent in one area several hundred feet southeast of the facility where the sand and gravel directly overlies the bedrock.

Logs of borings on Unifirst property reveal that the depth to bedrock varies from 16 to 62 feet. The bedrock is comprised of the Dedham Granodiorite- a coarse-grained, grayish-pink granodiorite that is PreCambrian in age. In this area, the bedrock is moderately to highly fractured; the fractures serve as a pathway of ground water flow.

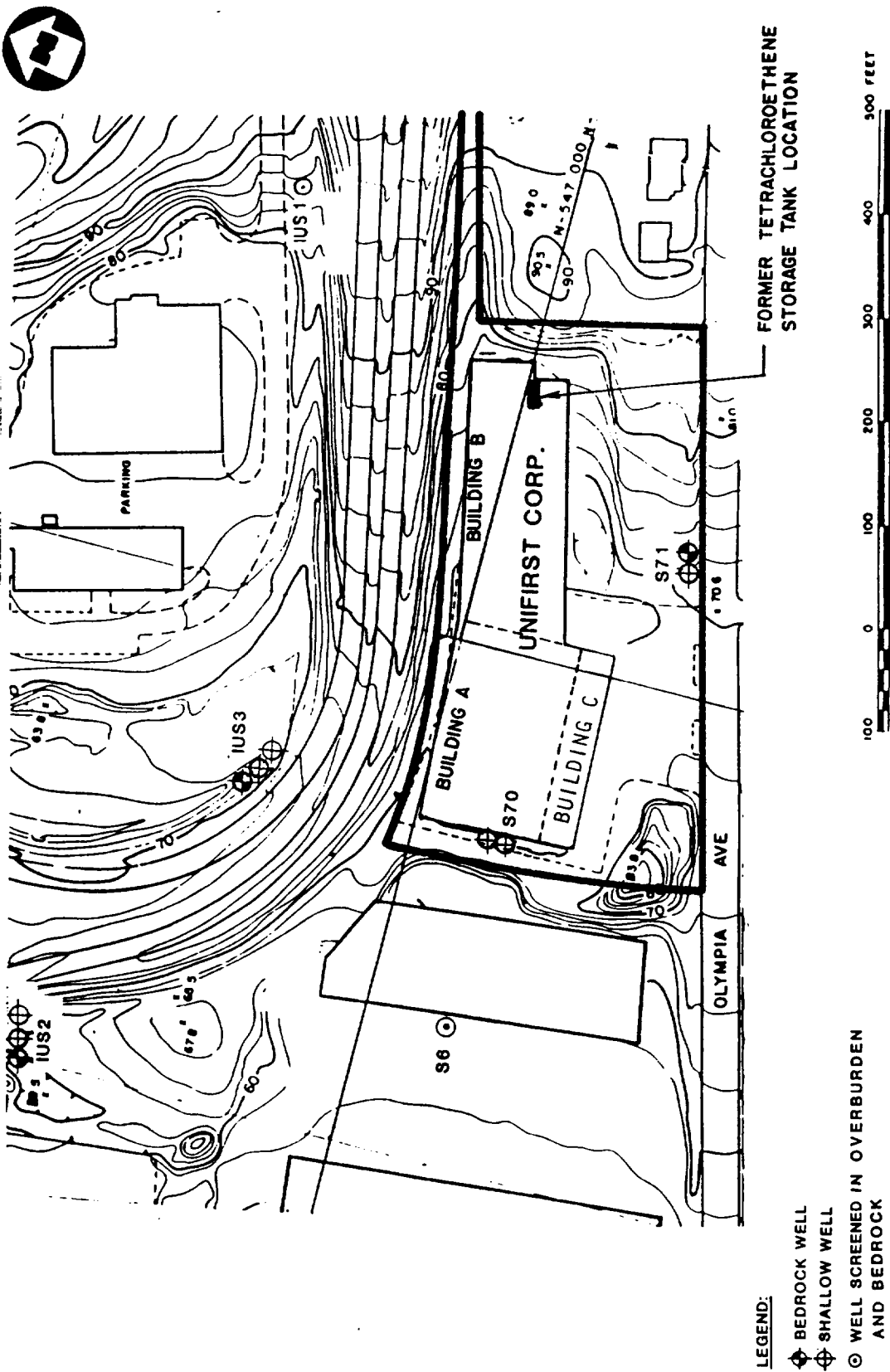


Figure 4. Site plan for Unifirst Corporation.<sup>1</sup>

## Waste Management Practices<sup>19</sup>

Operations at this location presently consist of corporate headquarters (offices) and warehouse space for the Unifirst Corporation. In the past, Interstate Uniform Services Corporation (IUSC) utilized this facility for the processing and dry cleaning of uniforms. Dry cleaning operations performed during 1966 through 1968, provided a small volume of white-shirt cleaning. Dry cleaning at the site consisted of small conventional washing machines and two 25 to 35 lb dry cleaning units. Tetrachloroethene was used as the solvent for the dry cleaning process. Given the size of the dry cleaning operation, only five to six 55-gallon drums of solvent were used per year. Tetrachloroethene was periodically drawn from a tapped 55-gallon drum on an as needed basis to support the dry cleaning operations. This drum was reportedly stored inside Building B where the dry cleaning operations were taking place. The facility no longer performs dry cleaning onsite.

To maintain the tetrachloroethene in a condition suitable for dry cleaning, the solvent was continuously passed through a diatomaceous earth filter to remove dirt and body oils. Once or twice a week, the dirty solvent was distilled. During distillation, the solvent was captured in the saturated diatomaceous earth filter and was reclaimed by heating the filter and directing the heated vapor to the distillation unit. The waste that resulted from the distillation process consisted primarily of diatomaceous earth containing approximately 20 percent by weight tetrachloroethene. Waste still bottoms generated at an approximate rate of 5 gallons/week were disposed of by drum containerization and transport to a municipal landfill, or placement in a facility dumpster and subsequently unloaded by a commercial refuse hauler. Company officials have stated that none of the waste still bottoms were disposed of on the site or on the surrounding property.<sup>19</sup>

The wastewater generated from the washing machines drained to wash troughs, which routed the wastewater to the municipal sewers. In the event that solvent spills occurred from the dry cleaning equipment, the spilled liquid would have drained to the wash trough and also discharged to the municipal sewer.

During 1977 through 1982, tetrachloroethene was stored in a 5,000 gallon indoor above-ground storage tank located in the eastern portion of Building B. Company officials report that the tank was installed in 1977 and was emptied and removed in November 1982. From 1977 until 1980, solvent stored in the tank was transferred to tank trucks for transport to other company-owned facilities. From 1980 through November 1982, the tank was used for the long-term storage of tetrachloroethene in order to take advantage of fluctuations in market prices. The tank was removed from the site to increase warehouse space and was subsequently moved to a company-owned facility in Connecticut. Tetrachloroethene is no longer stored at the site.

IUSC officials reported a spill of tetrachloroethene (estimated at less than 100-gallons) occurred within Building B in 1979. While pumping tetrachloroethene into the storage tank, excess solvent overflowed a vent on the top of the tank (inside the building). Solvent pooled on the concrete floor of the building. Employees report the spill was cleaned up by placing

used garments (uniforms, trousers, shirts) onto the spill, absorbing the tetrachloroethene. The garments were transported to another IUSC facility with dry cleaning operations to extract and reuse of the solvent contained in the garments.

#### RCRA Status

File reviews at the U.S. EPA Region 1 and the Massachusetts DEQE offices revealed little information concerning the RCRA status of the Unifirst facility. Hazardous waste is no longer handled, stored or generated at this site. The facility was considered a transporter of hazardous waste until Unifirst notified the DEQE on September 12, 1985 that they would no longer transport waste in Massachusetts. Effective December 31, 1985, their license to transport waste was terminated by the DEQE. The facility is presently used for Unifirst Corporate offices and warehouse storage of uniforms.

#### Studies Conducted

Environmental studies conducted for this facility are chiefly the result of the Section 3013 RCRA Consent Order issued in September 1983. The following is a brief summary of these studies.

ASSESSMENT OF GROUND WATER CONTAMINATION POTENTIAL AT INTERSTATE UNIFORM SERVICES CORPORATION, WOBURN, MA. Prepared for Goodwin Proctor & Hoar, 28 Boston Street, Boston, MA. Prepared by Environmental Research & Technology, Inc., Concord, MA. Submitted to EPA November 11, 1983--19

This report presented a historical perspective of the Unifirst Corporation site and a review of existing hydrogeological information. The site history was developed from aerial photographs, building permits, files at EPA Region I, and interviews with IUSC employees. (Much of this information has been presented in the Site History subsection of this report). The summary of the hydrogeology at the site was based on a series of reports compiled by Ecology and Environment, Inc. (1981, 1982).

The report concluded that there was no evidence of a solvent spill outside of the building which could have been of sufficient volume to cause the present levels of ground water contamination near the site. Any portion of the facility where solvent would have spilled or dumping of solvents could have occurred has been paved, thus reducing the potential for these materials to migrate into the ground water.

SUMMARY OF MONITORING PROGRAM, UNIFIRST CORPORATION, WOBURN, MA. Prepared by Environmental Research & Technology, Inc., Concord, MA. Submitted to EPA August 22, 1984--21

In partial fulfillment of the previously described consent order, a monitoring program was developed to investigate the presence of tetrachloroethene in ground water upgradient of the site. The program entailed a phased approach for the installation of monitoring wells at three locations hydraulically upgradient from the site. Data on the ground water elevations of ten wells near the facility were also

provided. Two soil samples were collected and analyzed for volatile organics. These samples were collected during the installation of monitoring well UC-2 located offsite and upgradient of the facility.

EVALUATION AND RECOMMENDATIONS FOR ALTERNATIVES CONCERNING ADDITIONAL INVESTIGATION OF GROUND WATER CONTAMINATION. Prepared for Unifirst Corporation, Woburn, MA. Prepared by Environmental Research & Technology, Inc., Concord, MA. Submitted to EPA September 24, 1984--22

This report was also prepared as a requirement of the September 1983 Consent Order. Specifically using data derived from the previously described Site Assessment and Monitoring reports, this report considered alternatives for additional investigation and for further actions to be taken on the Unifirst property. The report provided summaries of each of the two previously conducted reports.

Chemical analysis of water from wells UC-1, UC-2, and UC-3 (also known as IUS-1, IUS-2 and IUS-3) located upgradient of the facility indicated tetrachloroethene was not detected. The report concluded that even though the wells immediately upgradient of the Unifirst facility did not contain tetrachloroethene, no direct relationship between contamination in nearby Well S-6 and unknown contamination at the site could be made. The report stated that the contamination in Well S-6 appeared to originate in the bedrock.

ERT recommended no further investigation be undertaken by Unifirst. ERT also recommended that a better definition of ground water flow in bedrock be made in order to ascertain whether a relationship exists between contamination of Wells G & H and Well S-6.

#### Nature and Extent of Soil Contamination

There is limited data available on soil contamination at the Unifirst Corporation facility. NUS Corporation, contractors for EPA, performed in-house screening of soil samples obtained during the installation of monitoring wells S-71S and S-71D on the Unifirst Corporation property. Screening was performed using a Photovac 10A10 Gas chromatograph. The analytical technique is for the tentative identification of compounds by comparison of the retention time of the unknown compound to that of known standards. No quantitative standards are available for the headspace analysis of soil therefore no quantitation of the tentatively identified compounds were attempted.

Split spoon samples from boring S-71S were collected at two foot intervals. Tetrachloroethene was tentatively identified in each of the seven samples collected from boring S-71S.

It should be emphasized that these results indicate a possible presence of an unknown concentration of contamination. Further testing utilizing a more sensitive analytical technique would be required to better characterize the contamination at this site.



## OLYMPIA NOMINEE TRUST

### Location and History of Ownership

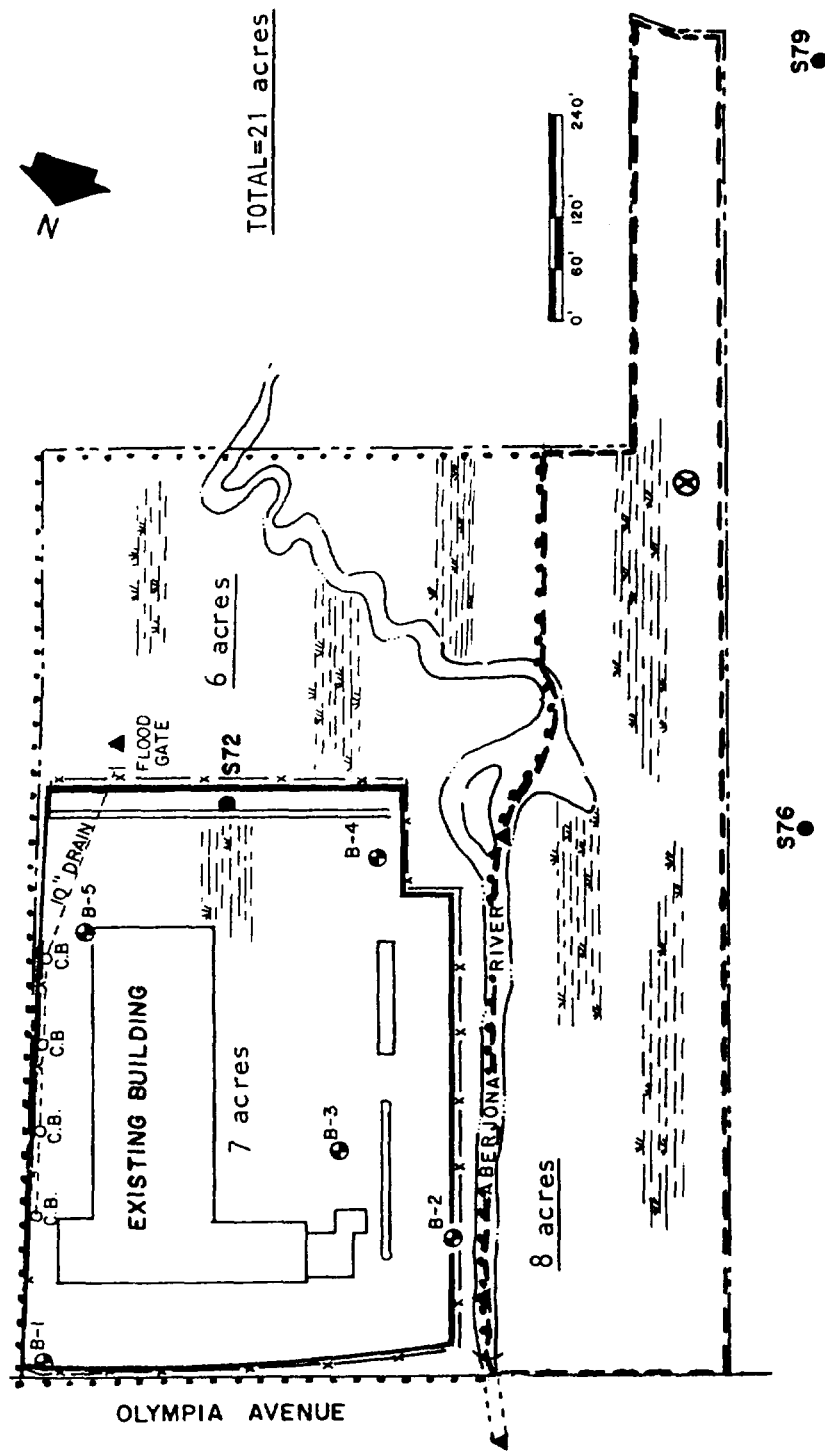
This facility is located on a parcel of land totalling approximately 21.4 acres at 60 Olympia Avenue, Woburn. Figure 5 presents a site map (prepared by Goldberg-Zoino & Associates, Inc., GZA) developed as part of an environmental site assessment.<sup>23</sup> Approximately 13 acres of the property lie east of the Aberjona River. A portion of this has been used as a trucking terminal. Approximately 8 acres of the property is undeveloped and is situated west of the Aberjona River. This undeveloped area was accessible by a dirt road paralleling the B&M railroad tracks from Olympia Avenue to Salem Street and is suspected to be the site of hazardous waste disposal. The property is located several hundred feet north-northwest of the former municipal water supply Wells G & H.

The property is presently owned by Olympia Nominee Trust and is being leased to United Truck Leasing Corporation. Olympia Nominee Trust obtained the property on March 15, 1985 from Juniper Development Group (a general partnership having the same partners as Olympia Nominee Trust). The same property was acquired by Juniper from Bristol Terminals, Inc. on May 18, 1983. The property was sold during the course of a Chapter 11 bankruptcy proceedings. Bristol Terminals, Inc. was a wholly-owned subsidiary of Hemingway Transport, Inc., both of which went through Chapter 11 proceedings. Bristol Terminals, Inc. acquired the property from Woburn Associates by deed of May 29, 1980.<sup>2</sup>

In February 1986, EPA Region I issued an Administrative Order<sup>24</sup> (under the authority of Section 106 of CERCLA) to the trustees of Olympia Nominee Trust requiring the removal of the drums on their property and the submission of an operation plan for the investigation of further contamination at the site. The drums and some of the surrounding soil have been removed. An operation plan for further soil and ground water testing has been submitted by Olympia Nominee Trust to EPA for review.

### Site Geology

Subsurface exploration data from the 8 acre truck terminal area of the site includes boring logs presented in a 21E Report by GZA<sup>11</sup>. These logs indicate that fill occurs at the surface down to a depth of 4 to 6 feet. Silty sand, fine to coarse sand and gravel underlie the fill layer. A layer of peat was encountered onsite in two of the borings at depths of 7 and 8.5 feet; the peat layer was 1.5 feet thick at one location and 3.5 feet thick at the other. The GZA borings on this part of the property were drilled to a depth of 15 feet and did not encounter bedrock. However, Well S-72, on this property and wells S76 and S79 west of the property, encountered bedrock at depths of 116, 128 and 107 feet, respectively. The boring log for these locations shows that bedrock is weathered and fractured.



NOTES:

- 1) BASE MAP TRACED FROM 21E SITE ASSESSMENT REPORT BY GZA. ORIGINAL SCALE 1" = 60'.
- 2) THE LOCATION OF EACH BORING AND SAMPLING LOCATION WAS APPROXIMATELY DETERMINED BY TAPE MEASUREMENTS AND "LINE OF SIGHT" FROM EXISTING TOPOGRAPHIC FEATURES. THIS DATA SHOULD BE CONSIDERED ACCURATE ONLY TO THE DEGREE IMPLIED BY THE METHOD USED.

⊗ APPROXIMATE LOCATION OF DRUMS AND CONTAMINATED SOIL. INVESTIGATED 9/17/85 BY EPA.

Figure 5. Site plan for Olympia Nominee Trust.

In the GZA borings onsite, ground water occurred at depths of 6 to 8 feet below the surface. A report prepared by Ecology and Environment, Inc. (E&E) in 1982,<sup>25</sup> indicated that ground water flow is toward the south southwest on the eastern side of the Aberjona River, and east southeast on the western side of the River.

#### Waste Management Practices

Historically, this site has been used for transportation and trucking operations. It is presently leased as a trucking terminal. According to the Environmental Assessment Report prepared by GZA,<sup>23</sup> the Hemingway Transport Company received permits for two 5,000 gallon underground storage tanks for diesel and fuel oil, one 1,000 gallon tank for waste oil, and 6,280 gallons of gasoline. The 6,280 gallon gasoline tank was found to contain water in May 1983 and was removed in July 1983. Two new underground storage tanks for diesel fuel were installed in 1983. No gasoline is currently stored on the site.<sup>23</sup>

#### RCRA Status

File reviews at the EPA and MA DEQE offices revealed no RCRA-related information for this facility. A letter dated November 1, 1982, from Hemingway Transport Company to the MA DEQE, complained of 17 drums containing an oily semi-solid waste was found on their property. Hemingway expressed a desire, but an inability (due to bankruptcy) to assist in remedial efforts. (GCA was unable to ascertain whether these were the same drums associated with an EPA Field investigation in September 1985.)

#### Studies Conducted

Presently, there are limited environmental data available for the property owned by Olympia Nominee Trust. Summaries of an Environmental Site Assessment (21E) and an EPA sampling effort are available, as described below:

ENVIRONMENTAL SITE ASSESSMENT, 60 OLYMPIA AVENUE, WOBURN, MA. Prepared for Juniper Development Group, Winchester, MA. Prepared by GZA, February 1985--<sup>23</sup>

Juniper Development Corporation contracted Goldberg-Zoino & Associates, Inc. (GZA) to conduct a "21E" inspection to evaluate the presence or absence of hazardous materials or oil in the environment at the site. Under the Massachusetts General Laws, Chapter 21E entitled "Massachusetts Oil and Hazardous Materials Release Prevention and Response Act" the liability for investigation and remediation of contamination problems is placed on the owner/operator of the property. As a result of this law, most banks and title insurers require site assessments prior to the sale of commercial properties. The GZA Site Assessment was limited to the trucking area and included a site visit, a review of site history, a limited field exploration program, screening analysis of soil and water samples, and quantitative analysis of ground water samples. Based on these studies GZA concluded that volatile organics were present in environmental media at the Olympia Nominee Trust site.

Aromatic volatile organic compounds (benzene, toluene, ethyl benzene and xylenes) detected in the ground water at observation well B-2 are constituents of petroleum products (most notably gasoline). The report suggested that the location of well B-2 (see Figure 5) is downgradient of the previously removed (July 1983) underground gasoline storage and tank from this information it has been suggested that this tank may have been the source of the detected compounds.

U.S. EPA MEMORANDUM from D. Grantz to B. Newman. Dated March 24, 1986, regarding sampling at Juniper Development Corporation--<sup>26</sup>

On September 19, 1985, EPA personnel were onsite at the Juniper Realty Trust property to investigate an area that contained approximately ten rusted drums situated in a pile. All of the drums were rusted with no identifying marks. Only two drums were upright and these were open-top type with solid material on the bottom and liquid on the surface. Adjacent to the drums was a small pile of caps from pesticide containers. Samples of the liquid in the two upright drums, soil in three locations, and one solid drum material were collected by EPA personnel. High levels of pesticides and PCBs were found in the soil adjacent to the drums and under pesticide caps near the drums. Chlorinated hydrocarbons were found in all samples collected. Bisphthalate, 2-methylnapthalene and 1,2,4-trichlorobenzene were also detected in the soil samples.

#### Nature and Extent of Soil Contamination

During the Site Assessment conducted by GZA a screening of soil samples with a HNU photoionization detector was performed during the installation of monitoring wells on the eastern section of the Olympia site. However, no evidence of soil contamination was reported.

The September 17, 1985 sampling (conducted by EPA Region I personnel) of drums and soil at the Olympia Nominee Trust Property is currently the only source of soil related analytical data available for this site. Results of the EPA sampling effort are provided in Table 4. Approximate location of the area where the drums were found is denoted on Figure 5.

TABLE 4. ANALYTICAL RESULTS FOR SOIL AND DRUM SAMPLING  
CONDUCTED AT OLYMPIA NOMINEE TRUST

Date Collected:	9-17-85	9-17-85	9-17-85	9-17-85
Sample ID:	Soil	Soil	Soil	Drum
Location:	Under pesticide cap	Adjacent Drum #1	Adjacent to Drums	#3
Sample No.:	82261	82262	82263	82266

Volatile Organics (ppb)

Trichlorofluoromethane	Present	ND-c	ND-e	ND-g
1,1-Dichloroethane	ND-a	11,000	ND-e	ND-g
Chloroform	ND-a	3,100	ND-e	ND-g
1,1,1,-Trichloroethane	1,500	49,000	ND-e	3,000
Trichloroethene	1,000	390,000	460	ND-g
Tetrachloroethene	380	32,000	57	7,400
Toluene	1,100	4,100	ND-e	3,000
Chlorobenzene	680	ND-c	ND-e	ND-g
Ethylbenzene	130	3,100	ND-e	ND-g
Total Xylenes	860	6,900	74	6,100

Extractable Organics (ppb)

Benzo(k)fluoranthene	ND-b/4600	ND-d	ND-f
Benzo(a)pyrene	ND-b/2100	ND-d	ND-f
Benzylbutylphthalate	23000/28000	ND-d	ND-f
bis(2-ethylhexyl)phthalate	15000/18000	430,000	9,300
Chrysene	ND-b/2500	ND-d	ND-f
Di-n-octylphthalate	6300/8600	ND-d	ND-7
Fluorene	ND-b/2100	ND-d	ND-f
Pyrene	2000/4600	ND-d	ND-f
1,2,4-Trichlorobenzene	ND-b/ND-b	1,100,000	ND-f
Benzoic Acid	25000/18000	ND-d	ND-f
2-Methylnapthalene	ND-b/ND-b	120,000	ND-f

Pesticides/PCBs (ppb)

Chlordane	1,400,000	51,000,000	42,000
Aroclor-1260	125,000	31,000,000	31,000

ND-a = Not detected at 77 ppb  
 ND-b = Not detected at 1,650 ppb  
 ND-c = Not detected at 3,100 ppb  
 Blank space - Not analyzed

ND-d = Not detected at 123,000 ppb  
 ND-e = Not detected at 57 ppb  
 ND-f = Not detected at 495 ppb  
 ND-g = Not detected at 3,053 ppb

## SECTION 3

### PUBLIC HEALTH AND ENVIRONMENTAL CONCERNS

This report has identified areas of contamination on four properties in the Woburn area, near municipal Wells G&H. These sources are a result of past waste disposal practices by the owner/operator or possibly illegal dumping on isolated, but accessible portions of the subject properties. Risk is a function of the endangerment potential of a contaminant, fate of transport and the receptors. Public health and environmental concerns resulting from this contamination will be discussed briefly here and in greater detail in the Endangerment Assessment Report being prepared under another Work Assignment.

Studies by EPA and consultants for the owner/operators of the subject properties have identified various chemicals in the soil.

Environmental transport and fate of pollutants is dependent on the physical and chemical properties of the compounds, the environmental transformation processes potentially affecting them, and the characteristics of the media through which they are migrating. Because existing site data do not adequately address these media from the perspective of environmental transport, the potential environmental behavior described below is necessarily very general. A similar overview of potential transport has been presented in the Phase I FS report,<sup>27</sup> and much of the following information has been taken from that document. Note that the transport and fate discussion for Part II of the RI concentrates on mechanisms relevant to migration of contaminants from soil into other media due to the focus of the Part II RI.

The following is a summary of the endangerment potential of select compounds found onsite at the facilities discussed in this remedial investigation.<sup>6,14,20,24</sup>

- Trichloroethene and tetrachloroethene have both been demonstrated to cause cancer in laboratory animals. Both chemicals are readily absorbed through the skin and lungs. These chemicals do not absorb to soil readily and are, therefore, expected to volatilize from the soil or migrate from the soil into the ground water. They are generally mobile in ground water.
- 1,2-trans-dichloroethene, 1,1-dichloroethane, and 1,1,1-trichloroethane can cause irritation to the eye and mucous membrane, as well as act as a narcotic. These chemicals do not tend to absorb to the soil significantly and are likely to volatilize into the air and/or migrate from the soil into the ground water. They are generally mobile in ground water.

- Xylene and Toluene both affect the central nervous system and may result in dizziness, nausea, and lack of coordination. Xylene and toluene can cause irritation of the upper respiratory tract, throat, eyes and skin. Toluene and xylene tend to volatilize or migrate from the soil into the ground water. They are generally mobile in ground water.
- Chlordane is a pesticide which is toxic to the central nervous system and can cause instability, labored respiration, convulsions and death. Chlordane is generally not volatile and tends to adsorb to the soil, thus having limited mobility in ground water. Chlordane may be released to air via fugitive dust and is relatively persistent in the environment.
- Polychlorinated biphenyls (PCBs) have been demonstrated to cause cancer in animals and are suspect human carcinogens. PCBs can bioaccumulate and have been found in mother's milk. They are very persistent and stable in the environment but do not generally volatilize from soil or migrate to ground water. They may be released to air via adsorption on fugitive dust.

#### W. R. GRACE & COMPANY, INC.

This property is presently used for manufacturing purposes by W. R. Grace. Most of the contamination at this site is in the subsurface levels minimizing possible air emissions from the site. The contamination is chiefly volatile organic compounds that were disposed of on the soil at the facility. The primary environmental and public health concern associated with this facility is the contamination of ground water. The ground water contamination is described in Part I of this Remedial Investigation report.

#### WILDWOOD CONSERVATION CORPORATION

This parcel of land is now encircled by cyclone fencing with barbed wire. Provision has been made to have a guard walk the perimeter of the fence. These measures have been taken as a result of the EPA Administrative Order to secure the site against unwarranted entry. These measures will limit the exposure of the general public to the contaminants in the soil, drums, and the debris still present on the site.

These debris piles are contributing to the ground water contamination in the area. It is also possible that volatile organic compounds are being emitted to the atmosphere, as many of the compounds identified in the soil samples associated with this site have high vapor pressures making them likely to volatilize. Pesticides have been found on the soil surface, thus allowing for the possibility of airborne contamination if the soil is disturbed.

#### UNIFIRST CORPORATION

The Unifirst property is suspected of contributing to the ground water contamination in the area. Volatile organic contamination has been detected in ground water samples collected at monitoring wells 5715 and 571D on the property. There has not been a complete investigation of possible soil contamination on the Unifirst property that could have contributed to the ground water contamination.

Nearly all of the Unifirst property is asphalt paved. This paving will inhibit volatilization of any existing contaminants in the soil. The location of the suspected sources and extent of contamination is not known. The source of contamination needs to be determined and characterized.

The area is accessible to the employees of the Unifirst Corporation. Since the potential source is considered to be under the asphalt, there appears minimal present-day risk of volatilization of contaminants into the atmosphere or direct contact with contaminated soil.

#### OLYMPIA NOMINEE TRUST

Data describing environmental conditions at this site are sparse. An underground gasoline storage tank leak in the trucking area and discovery and investigation of a pile of drums on the southwest portion of the site has been identified. The leaking gasoline storage tank has been removed. The area where drums and contaminated soil has been found represents a small portion of the total property. Drums were found in a sector that is accessible to the general public.

The drums and some surrounding soil that were investigated by EPA in September 1985 have since been removed. There may still exist soil contamination in the area in which these drums were found. Persons who wander onto the site may be exposed to contaminants that may be present in surface soils. Further investigation of the property is required to determine the presence of additional hazardous waste contamination on the property.



## SECTION 4

### SUMMARY AND CONCLUSIONS

#### W. R. GRACE & COMPANY, INC.

Based on a review of the available data, it can be concluded that the W. R. Grace property has been contaminated with several different volatile and extractable organic compounds. This contamination is a result of past waste management practices at the facility. There is evidence that facility personnel disposed of at least six 55 gallon drums of hazardous materials in a pit located approximately 100 feet east of the main building. Two of these drums were recovered partially full of wastes and one was found to contain more than 100,000 parts per billion (ppb) trichloroethylene, and 9,800 ppb trans-1,2-dichloroethene. Additionally several other volatile organic compounds were detected at high concentrations.

The soil and water samples collected in the pit indicated a presence of the same contaminants found in the drums. All drums and associated contaminated soil were reported removed from the site to a secure disposal area. Contaminant levels at the pit area are presently being monitored.

Further investigation of the facility by subsurface geophysical investigation and a review of aerial photographs has identified a west to east trending drainage ditch on the southeast section of the property. This ditch was excavated (trench 7A), sampled, and found to contain high concentrations of several volatile organics, most notably tetrachloroethene (520 ppb), trichloroethene (3,200 ppb), trans-1,2-dichloroethene (8,400 ppb), and toluene (12,000 ppb) in a water sample collected at a depth of 10 feet. A storm sewer drainage pipe outlet discovered during the investigation of Trenches 7 and 7A. Sludge and metal filings were found in the pipe and in the area near the exit to the pipe. Additional samples of the pipe contents reportedly identified the presence of toluene (430 ppb) and trans-1,2-dichloroethene (760 ppb).

Additional trenches have been excavated in other areas of the W. R. Grace property where the dumping of hazardous waste was suspected (complete descriptions in Appendix B). Samples from Trenches 25 and 30, near the center of the property, reported more volatile organic contamination. Depositions taken of W. R. Grace employees for the court case Anderson et al. V. Cryovac et al., provided additional documentation of the disposal of hazardous waste on the ground "out in back" of the facility.

W. R. Grace has also investigated the possibility of leaky sewer lines serving their facility. It is known that wastes were routinely dumped down the city sewer.<sup>7</sup> Inspection of the sewer lines found a broken leaking pipe elbow that may have allowed for an undeterminable amount of hazardous waste to escape into the soil and ground water below the pipe. Samples collected during sewer and storm drain assessment showed the presence of volatile organics, phthalates and PCBs. However, analyses conducted did not meet EPA QA/QC protocol and, therefore, are not presented in this report.

In summary, it can be concluded that areas of contamination on this property are likely to be contributing to the ground water contamination in the vicinity of the W. R. Grace property. Specifically, an area near Trench 7 shows signs of contamination from the outlet of a storm drain pipe. An additional source of contamination associated with leaking sewer lines has been identified but not fully verified. This site does not appear to present an immediate health threat since the areas of contamination are not easily accessible. However, the contamination should be considered prior to any future land use at the site.

#### WILDWOOD CONSERVATION CORPORATION

The undeveloped parcel of land that has been owned at different times by J. J. Riley Company and Beatrice Foods is now owned by the Wildwood Conservation Corporation. The area has been investigated by several environmental consultants (i.e. Woodward-Clyde, NUS Corporation, Weston Geophysical) from which numerous areas of contamination have been identified.

At least nine piles of debris were identified on a detailed site activity map developed by the Weston Geophysical Corp. Areas of discolored soil, rust drums, pesticide containers, tarry sludge and trash have been found throughout the site. Soil samples were collected with a hand auger by Weston Geophysical Corp. at ten locations on the property. Auger samples in the central sector of the site reported high concentrations of trichloroethene (7,000 ppb, 11,000 ppb, 2,200 ppb), tetrachloroethene (2,800 ppb, 2,400 ppb, 130,000 ppb), and trans-1,2-dichloroethene (3,600 ppb, 3,600 ppb, 2,700 ppb) at subsurface depths from 26 to 40 inches. An additional surface soil taken in this area also was found to contain 9,300 ppb chlordane. Other samples collected with a hand auger near the southeast property line show no contamination. Samples collected during the installation of well W-13 contained high concentrations of trichloroethene, i.e., 89,000 ppb TCE at depths between 2 to 4 feet.

This site has been well characterized and found to contain several areas of varying degrees of contamination. Contamination does not appear localized in any particular area of the WCC property. Volatile organic compounds and pesticides have been found near the western border (borings A-3, A-4, A-5) of the property. The site is fenced and guarded to reduce possibilities of unauthorized entry. The area does not pose an immediate health threat as long as the security is maintained. The areas of contamination must be considered prior to any future land at the site.

## UNIFIRST CORPORATION

The Unifirst Corporation historically operated a dry-cleaning operation at their facility, utilizing and storing tetrachloroethene. A tetrachloroethene spill in the area of the above-ground storage tank was reported in 1979. The spill was reportedly contained and cleaned up within the confines of the building. Tetrachloroethene has been reported in several monitoring wells downgradient of the facility. An Administrative Order by EPA instructed IUSC (now Unifirst) to install a network of wells upgradient of the facility to determine if the contamination occurred upgradient, as well as downgradient of their facility. This investigation found very little ground water contamination immediately upgradient of the facility at Well sites IUS-1, IUS-2, and IUS-3. This, coupled with a history of tetrachloroethene use at the Unifirst facility suggests that Unifirst is a likely source of this contamination. An investigation of the subsurface on the Unifirst property is recommended to better define the presence of contaminated soil and its possible contribution to aquifer contamination.

## OLYMPIA NOMINEE TRUST

An EPA investigation conducted in September of 1985 verified the presence, on the southwest portion of the property, of approximately ten rusted drums and some debris. Adjacent to the drums were a small pile of pesticide caps. The soil under a small pile of caps from pesticide containers was found to contain 1,400 ppm chlordane, while the soil adjacent to one of the drums had chlordane concentrations of 51,000 ppm (5.1 percent). The same soil sample adjacent to drum No. 1 also contained 31,000 ppm Arochlor-1260 (PCBs). Chlorinated hydrocarbons were also found in all soil samples collected in this area including (highest concentration only reported): 11,000 ppb 1,1-dichloroethane; 390,000 ppb trichloroethene; 32,000 ppb tetrachloroethene; 49,000 ppb 1,1,1-trichloroethane. Other contaminants found in this area include: toluene 4,100 ppb; ethylbenzene 3,100 ppb; total xylenes 6,900 ppb, chloroform 3,100 ppb; bis(2-ethyl hexyl) phthalate 430,000 ppb; 1,2,4-trichlorobenzene 1,100,000 ppb and 2-methynaphthalene 120,000 ppb. The drums have been subsequently removed, as has some of the contaminated soil, however, this area may represent a potential risk to public health and the environment.

Alliance recommends a reconnaissance investigation of the property to determine if other areas of hazardous waste contamination have occurred on the site west of the Aberjona River.

This facility also reported a leaking underground gasoline storage tank. The tank was found to contain water in May 1983 and was removed in July 1983. Gasoline is no longer stored on the site. Several aromatic volatile organic compounds were found in samples collected from monitoring Well B-2 which is located downgradient from the former gasoline storage tank. Alliance was unable to determine whether contaminated soil associated with the former tank was removed when the tank was replaced. A more thorough investigation into the gasoline tank removal is required. Additional consideration should be given to the other underground storage tanks on the Olympia property. Tanks used for the storage of diesel fuel, fuel oil and waste oil should be tested to assure they are not leaking.

#### REFERENCES

1. Wells G & H Remedial Investigation Part I. Prepared by NUS Corporation for EPA Region I. Final Report, September 1986.
2. Multi-Site Title Search. Conducted by GCA under TES I Work Assignment 088 for EPA Region I.
3. Information Request Pursuant to Section 3007 of RCRA. From V. Forte, General Manager, Woburn Facility to Director of Enforcement Division, EPA Region I. February 5, 1982.
4. W. R. Grace Site Activity Map, provided by Geo-Environmental Consultants, Inc., White Plains, NY. Consultants for W. R. Grace.
5. Information Request Pursuant to Section 3007 of RCRA. From D. Manzelli to Director of Enforcement Division, EPA Region I. 1982.
6. U.S. EPA Administrative Order against W. R. Grace Cryovac Division, Docket No. 83-1008. Dated May 9, 1983.
7. CIVIL ACTION No. 82-1672-S. Anne Andersen vs. Cryovac. Answers of W. R. Grace to Plaintiffs Interrogatories. February 7, 1983.
8. Compliance inspection at W. R. Grace Woburn Facility by MA DEQE. Conducted in 1983.
9. Field Investigations and Remedial Measures, W. R. Grace and Company, Cryovac Division, Phases I-III, Final Report. Prepared by GeoEnvironmental Consultants, Inc., White Plains, NY. May 1984.
10. Trip Report: Excavation at W. R. Grace & Company, Woburn, MA. Prepared by NUS Corporation for EPA Region I, TDD File No. F1-0300-01. June 21, 1983.
11. Field Investigations and Remedial Measures, W. R. Grace and Company, Cryovac Division, Phase VI - Field Descriptions. Prepared by GeoEnvironmental Consultants, Inc., White Plains, NY. August 1986.
12. Data Report: Excavations at the W. R. Grace site, Woburn, MA. Prepared by NUS Corporation for EPA Region I, TDD File No. F1-8506-02. May 9, 1986.

13. Trip Report: Technical Oversight at the W. R. Grace Site, Woburn, MA. Prepared by NUS Corporation for EPA Region I. TDD No. F1-8506-02, January 26, 1986.
14. U.S. EPA Administrative Order Against Beatrice. Foods, Docket No. 83-1007. Dated May 9, 1983.
15. U.S. EPA Administrative order against Wildwood Conservation Corporation, Docket No. I-86-1011. Dated December 12, 1985.
16. Geohydrology and Groundwater Contamination, J.J. Riley Site, Woburn, MA. Prepared for Lowenstein, Sandler and Associates, Roseland, NJ. Prepared by Woodward-Cycle Associates, Wayne, NJ. January 31, 1983.
17. Phase II Ground Water Investigation, J.J. Riley Site, Woburn, MA. Prepared for Lowenstein, Sandler & Associates, Roseland, NJ. Prepared by Woodward-Clyde Consultants, Wayne, NJ. November 1, 1984.
18. J. J. Riley Site Activity Map. Prepared by Weston Geophysical Corporation, Westboro, MA February 27, 1986.
19. Assessment of Ground Water Contamination Potential at Interstate Uniform Services Corporation, Woburn, MA. Prepared for Goodwin, Procter and Hoar. Prepared by Environmental Research & Technology, Inc., Concord, MA. November 1983.
20. U.S. EPA Administrative Order Against Interstate Uniform Services Corporation, Docket No. 83-1006. Dated May 9, 1983.
21. Summary of Monitoring Program, Unifirst Corporation, Woburn, MA. Prepared for Goodwin, Procter and Hoar. Prepared by Environmental Research & Technology, Inc., Concord, MA. Submitted to EPA August 22, 1984.
22. Evaluations and Recommendations for Alternatives Concerning Additional Investigation of Ground Water Contamination. Prepared for Goodwin, Procter and Hoar. Prepared for Unifirst Corporation, Woburn, MA. Prepared by Environmental Research & Technology, Inc., Concord, MA. Submitted to EPA September 24, 1984.
23. Site Assessment Report for Juniper Development Group. Prepared by Goldberg, Zoino Associates, Upper Newton Falls, MA. February 1985.
24. U.S. EPA Administrative Order Against Olympia Nominee Trust, Docket No. I-86-1018. Dated February 7, 1986.
25. Evaluation of the Hydrology and Groundwater Quality of East and North Woburn, MA. Prepared by Ecology and Environment, Inc., Field Investigation Team, Region I. June 1982.

26. U.S. EPA Memorandum from D. Grantz to B. Newman Regarding Sampling at Juniper Development Corporation. March 24, 1986.
27. Nunno, T., etal. GCA Corporation. Woburn Wells G&H: Phase I Feasibility Study, Draft Final Report. June/July 1985.

APPENDIX A

DETECTION LIMITS

DETECTION LIMITS FOR SAMPLES COLLECTED ON W.R. GRACE  
PROPERTY BY NUS CORPORATION

Semivolatile (Base/Neutral/Acid) Organics

Compound	CRDL (ug/l)	Compound	CRDL (ug/l)
Phenol	20	Acenaphthene	20
bis(2-Chloroethyl)Ether	20	2,4-Dinitrophenol	100
2-Chlorophenol	20	4-Nitrophenol	100
1,3-Dichlorobenzene	20	Dibenzofuron	20
1,4-Dichlorobenzene	20	2,4-Dinitrotoluene	20
Benyl Alcohol	20	2,6-Dinitrotoluene	20
1,2-Dichlorobenzene	20	Diethylphthalate	20
2-Methylphenol	20	4-Chlorophenyl-phenylether	20
bis(2-chloroisopropyl)Ether	20	Fluorene	20
4-Methylphenol	20	4-Nitroaniline	100
N-Nitroso-Di-n-Propylamine	20	4,6-Dinitro-2-Methylphenol	100
Hexachloroethane	20	N-Nitrosodiphenylamine (1)	20
Nitrobenzene	20	4-Bromophenyl-phenylether	20
Isophorone	20	Hexachlorobenzene	20
2-Nitrophenol	20	Pentachlorophenol	100
2,4-Dimethylphenol	20	Phenanthrene	20
Benzoic Acid	20	Anthracene	20
bis(2-Chloroethoxy)Methane	20	Di-n-Butylphthalate	20
2,4-Dichlorophenol	20	Fluoranthene	20
1,2,4-Trichlorobenzene	20	Pyrene	20
Naphthalene	20	Butylbenzylphthalate	20
4-Chloroaniline	20	3,3-Dichlorobenzidine	40
Hexachlorobutadiene	20	Benzo (a) Anthracene	20
4-Chloro-3-Methylphenol	20	bis(2-Ethylhexyl)Phthalate	20
2-Methylnaphthalene	20	Chrysene	20
Hexachlorocyclopentadiene	20	Di-n-Octyl Phthalate	20
2,4,6-Trichlorophenol	20	Benzo (b) Fluoranthene	20
2,4,5-Trichlorophenol	100	Benzo (k) Fluoranthene	20
2-Chloronaphthalene	20	Benzo (a) Pyrene	20
2-Nitroaniline	100	Indeno(1,2,3-cd)Pyrene	20
Dimethyl Phthalate	20	Dibenzo(a,h)Anthracene	20
Acenaphthylene	20	Benzo(g,h,i)Perylene	20
		3-Nitroaniline	100

CRDL - Contract required detection limits



DETECTION LIMITS FOR SAMPLES COLLECTED ON W.R. GRACE  
PROPERTY BY NUS CORPORATION

Element	CRDL	Element	CRDL
1. Aluminum	200	13. Magnesium	5000
2. Antimony	60	14. Manganese	15
3. Arsenic	10	15. Mercury	0.2
4. Barium	200	16. Nickel	40
5. Beryllium	5	17. Potassium	5000
6. Cadmium	5	18. Selenium	5
7. Calcium	5000	19. Silver	10
8. Chromium	10	20. Sodium	5000
9. Cobalt	50	21. Thallium	10
10. Copper	25	22. Tin	40
11. Iron	100	23. Vanadium	50
12. Lead	5	24. Zinc	20

CRDL - Contract required detection limits

DETECTION LIMITS FOR SAMPLES COLLECTED ON W.R. GRACE  
PROPERTY BY NUS CORPORATION

Compound	<u>Volatile Organics</u>		<u>Pesticides/PCBs</u>	
		CRDL (ug/l)	Compound	CRDL (ug/l)
Chloromethane		10	Alpha-BHC	0.05
Bromomethane		10	Beta-BHC	0.05
Vinyl Chloride		10	Delta-BHC	0.05
Chloroethane		10	Gamma-BHC (Lindane)	0.05
Methylene Chloride		5	Heptachlor	0.05
Acetone		10	Aldrin	0.05
Carbon Disulfide		5	Heptachlor epoxide	0.05
1,1-Dichloroethene		5	Endosulfan I	0.05
1,1-Dichloroethane		5	Dieldrin	0.10
Trans-1,2-Dichloroethene		5	4,4'-DDE	0.10
Chloroform		5	Endrin	0.10
1,2-Dichloroethane		5	Endosulfan II	0.10
2-Butanone		10	4,4'-DDD	0.10
1,1,1-Tetrachloroethene		5	Endrin Aldehyde	0.10
Carbon Tetrachloride		5	Endosulfan Sulfate	0.10
Vinyl Acetate		10	4,4'-DDT	0.10
Bromodichloromethane		5	Methoxychlor	0.50
1,2-Dichloropropane		5	Endrin ketone	0.10
Trans-1,3-Dichloropropene		5	Chlordane	0.50
Trichloroethene		5	Toxaphene	1
Dibromochloromethane		5	Aroclor-1016	0.50
1,1,2-Trichloroethane		5	Aroclor-1221	0.50
Benzene		5	Aroclor-1242	0.50
cis-1,3-Dichloropropene		5	Aroclor-1248	0.50
2-Chloroethylvinylether		10	Aroclor-1254	1
Bromoform		5	Aroclor-1260	1
4-Methyl-2-Pentanone		10		
2-Hexanone		10		
Tetrachloroethene		5		
1,1,2,2-Tetrachloroethane		5		
Toluene		5		
Chlorobenzene		5		
Ethylbenzene		5		
Styrene		5		
Total Xylenes		5		

CRDL - Contract required detection limits

DETECTION LIMITS FOR JUNIPER REALTY TRUST ANALYTICAL DATA  
Volatile Organic Compounds, ng/gm

Sample ID No.	82261	82262	82263	82266
Priority Pollutants				
Chloromethane	462	18600	342	18318
Bromomethane	154	6200	114	6106
Vinyl Chloride	308	12400	228	12212
Chloroethane	308	12400	228	12212
Methylene Chloride	77	3100	57	3053
Trichlorofluoromethane	*	*	*	*
1,1-Dichloroethylene	77	3100	57	3053
1,1-Dichloroethane	77	3100	57	3053
1,2-Dichloroethylene isomers	77	3100	57	3053
Chloroform	77	3100	57	3053
1,2-Dichloroethane	385	15500	285	15265
1,1,1-Trichloroethane	77	3100	57	3053
Carbon Tetrachloride	77	3100	57	3053
Bromodichloromethane	77	3100	57	3053
1,2-Dichloropropane	77	3100	57	3053
t-1,3-Dichloropropene	77	3100	57	3053
Trichloroethylene	77	3100	57	3053
Dibromochloromethane	77	3100	57	3053
c-1,3-Dichloropropene	308	12400	228	12212
1,1,2-Trichloroethane	77	3100	57	3053
Benzene	154	6200	114	6106
2-Chloroethylvinyl ether	154	6200	114	6106
Bromoform	77	3100	57	3053
Tetrachloroethylene	77	3100	57	3053
1,1,2,2-Tetrachloroethane	77	3100	57	3053
Toluene	77	3100	57	3053
Chlorobenzene	77	3100	57	3053
Ethylbenzene	77	3100	57	3053
Acrolein	2310	93000	1710	91590
Acrylonitrile	2310	93000	1710	91590

Hazardous Substances

Acetone	1155	46500	855	45795
Carbon Disulfide	77	3100	57	3053
2-Butanone	1155	46500	855	45795
Vinyl Acetate	231	9300	171	9159
2-Hexanone	231	9300	171	9159
4-Methyl-2-Pentanone	77	3100	57	3053
Styrene	154	6200	114	6106
Xylenes (total)	154	6200	114	6106

\* Trapping efficiency of Tenax trap is low

DETECTION LIMITS FOR JUNIPER REALTY TRUST ANALYTICAL DATA  
Chlorinated Pesticides and Polychlorinated Biphenyls, mg/kg

Sample ID No.	82261	82262	82263	82266
Priority Pollutants				
Aldrin	13	125	0.25	NA
alpha-BHC	13	125	0.25	NA
beta-BHC	13	125	0.25	NA
delta-BHC	13	125	0.25	NA
gamma-BHC	13	125	0.25	NA
Chlordane	200	2000	4.00	NA
4,4'-DDD	25	250	0.5	NA
4,4'-DDE	25	250	0.5	NA
4,4'-DDt	25	250	0.5	NA
Dieldrin	25	250	0.5	NA
Endosulfan I	13	125	0.25	NA
Endosulfan II	25	250	0.5	NA
Endosulfan sulfate	25	250	0.5	NA
Endrin	25	250	0.5	NA
Endrin aldehyde	25	250	0.5	NA
Endrin ketone	13	125	0.25	NA
Heptachlor	13	125	0.25	NA
Heptachlor epoxide	13	125	0.25	NA
Methoxychlor	200	200	4.00	NA
Toxaphene	200	2000	4.00	NA
Aroclor-1016	250	2500	5.00	NA
Aroclor-1221	250	2500	5.00	NA
Aroclor-1232	250	2500	5.00	NA
Aroclor-1248	125	1250	2.5	NA
Aroclor-1254	125	1250	2.5	NA
Aroclor-1260	125	1250	2.5	NA
Aroclor-1262	125	1250	2.5	NA
Aroclor-1268	125	1250	2.5	NA

DETECTION LIMITS FOR JUNIPER REALTY TRUST ANALYTICAL DATA  
GC/MS Extractable Organics, mg/kg

Sample ID No.	82261	82262	82263	82266
Priority Pollutants				
Acenaphthene	1.65	123.75	0.495	NA
Acenaphthylene	1.65	123.75	0.495	NA
Anthracene	1.65	123.75	0.495	NA
Benzo(a)anthracene	1.65	123.75	0.495	NA
Benzo(b)fluoranthene	1.65	123.75	0.495	NA
Benzo(k)fluoranthene	1.65	123.75	0.495	NA
Benzo(a)pyrene	1.65	123.75	0.495	NA
Benzo(ghi)perylene	1.65	123.75	0.495	NA
Benzylbutylphthalate	1.65	123.75	0.495	NA
Bis(2-chloroethyl)ether	1.65	123.75	0.495	NA
Bis(2-chloroethoxy)methane	1.65	123.75	0.495	NA
Bis(2-ethylhexyl)phthalate	1.65	123.75	0.495	NA
Bis(2-chloroisopropyl)ether	1.65	123.75	0.495	NA
4-Bromophenylphenylether	1.65	123.75	0.495	NA
4-Chloro-3-methylphenol	1.65	123.75	0.495	NA
2-Chloronaphthalene	1.65	123.75	0.495	NA
2-Chlorophenol	1.65	123.75	0.495	NA
4-Chlorophenylphenylether	1.65	123.75	0.495	NA
Chrysene	1.65	123.75	0.495	NA
Dibenzo(a,h)anthracene	1.65	123.75	0.495	NA
Di-n-butylphthalate	1.65	123.75	0.495	NA
1,2-Dichlorobenzene	1.65	123.75	0.495	NA
1,2-Dichlorobenzene	1.65	123.75	0.495	NA
1,4-Dichlorobenzene	1.65	123.75	0.495	NA
3,3'-Dichlorobenzidine	3.3	247.5	0.99	NA
2,4-Dichlorophenol	1.65	123.75	0.495	NA
Diethylphthalate	1.65	123.75	0.495	NA
2-4-Dimethylphenol	1.65	123.75	0.495	NA
Dimethylphthalate	1.65	123.75	0.495	NA
2,4-Dinitrophenol	0.8	600	2.4	NA
2,4-Dinitrotoluene	1.65	123.75	0.495	NA
2,6-Dinitrotoluene	1.65	123.75	0.495	NA
Di-n-octylphthalate	1.65	123.75	0.495	NA
Fluoranthene	1.65	123.75	0.495	NA
Fluorene	1.65	123.75	0.495	NA
Hexachlorobenzene	1.65	123.75	0.495	NA
Hexachlorobutadiene	1.65	123.75	0.495	NA
Hexachlorocyclopentadiene	1.65	123.75	0.495	NA
Hexachloroethane	1.65	123.75	0.495	NA
Indeno(1,2,3-cd)pyrene	1.65	123.75	0.495	NA

\*std RF>30%

DETECTION LIMITS FOR JUNIPER REALTY TRUST ANALYTICAL DATA  
GC/MS Extractable Organics, mg/kg (cont.)

Sample ID No.	82261	82262	82263	82266
Priority Pollutants				
Isophorone	1.65	123.75	0.495	NA
2-Methyl-4,6-dinitrophenol	8	600	2.4	NA
Naphthalene	1.65	123.75	0.495	NA
Nitrobenzene	1.65	123.75	0.495	NA
2-Nitrophenol	1.65	123.75	0.495	NA
4-Nitrophenol	8	600	2.4	NA
N-nitrosodiophenylamine	1.65	123.75	0.495	NA
N-Nitrosodi-n-propylamine	1.65	123.75	0.495	NA
Pentachlorophenol	8	600	2.4	NA
Phenanthrene	1.65	123.75	0.495	NA
Phenol	1.65	123.75	0.495	NA
Pyrene	1.65	123.75	0.495	NA
1,2,4--Trichlorobenzene	1.65	123.75	0.495	NA
2,4,6-Trichlorophenol	1.65	123.75	0.495	NA
Hazardous Substances				
Benzoic Acid	8	600	2.4	NA
Benzyl Alcohol	1.65	123.75	0.495	NA
4-Chloroaniline	1.65	123.75	0.495	NA
Dibenzofuran	1.65	123.75	0.495	NA
4,6-Dinitro-2-methylphenol	8	600	2.4	NA
2-Methylnaphthalene	1.65	123.75	0.495	NA
2-Methylphenol	1.65	123.75	0.495	NA
4-Methylphenol	1.65	123.75	0.495	NA
2-Nitroaniline	8	600	2.4	NA
3-Nitroaniline	8	600	2.4	NA
4-Nitroaniline	8	600	2.4	NA
2,4,5-Trichlorophenol	8	600	2.4	NA

\*std RF>30%

DETECTION LIMITS FOR DATA FROM WILDWOOD CONSERVATION CORPORATION  
ANALYZED BY ERCO LABORATORY

Compound	Detection Limit
Chloromethane	5
Bromomethane	5
Vinyl Chloride	2
Chloroethane	5
Methylene Chloride	1
1,1-Dichloroethylene	1
1,1-Dichloroethane	1
1,2-Trans-Dichloroethene	1
Chloroform	1
1,2-Dichloroethane	1
1,1,1-Trichloroethane	1
Carbon Tetrachloride	1
Bromodichloromethane	1
1,2-Dichloropropane	2
Trans-1,3-Dichloropropylene	2
Trichloroethylene	1
Dibromochloromethane	1
c-1,3-Dichloropropene	2
1,1,2-Trichloroethane	2
Bromoform	5
1,1,2,2-Tetrachloroethane	2
Tetrachloroethylene	1
Chlorobenzene	5
2-chloroethyl vinyl ether	10

DETECTION LIMITS FOR VOLATILE ORGANIC ANALYSES BY ETC

Trench #	7A	7A	7A	7		30
Matrix	Sludge	Water	Water	Soil	Sludge	Soil
Sample #	J0133	J0454	J0453	J0135	J0140	J1439
Acrolein	500	100	500	500	5000	500
Acrylonitrile	500	100	500	500	5000	500
Benzene	22	4.4	22	22	220	22
Bis(chloromethyl)ether	50	10.0	50	50	500	50
Bromoform	24	4.7	24	24	240	24
Carbon Tetrachloride	14	2.8	14	14	140	14
Chlorobenzene	30	6.0	30	30	300	30
Chlorodibromomethane	16	3.1	16	16	160	16
Chloroethane	50	10.0	50	50	500	50
2-Chlorovinyl ether	50	10.0	50	50	500	50
Chloroform	8	1.6	8	8	80	8
Dichlorobromomethane	11	2.2	11	11	110	11
Dichlorodifluoromethane	50	10.0	50	50	500	50
1,1-Dichloroethane	24	4.7	24	24	240	24
1,2-Dichloroethane	14	2.8	14	14	140	14
1,1-Dichloroethene	14	2.8	14	14	140	14
1,2-Dichloropropane	30	6.0	30	30	300	30
Cis-1,3-dichloropropene	25	5.0	25	25	250	25
Ethylbenzene	36	7.2	36	36	350	36
Methyl Bromide	50	10.0	50	50	500	50
Methyl Chloride	50	10.0	50	50	500	50
Methylene Chloride	14	2.8	14	14	140	14
1,1,2,2-Tetrachloroethane	35	6.9	35	35	350	35
Tetrachloroethylene	21	4.1	21	21	210	21
Toluene	30	6.0	30	30	300	30
trans-1,2-Dichloroethene	50	1.6	50	50	80	50
1,1,1-Trichloroethane	19	3.8	19	19	190	19
1,1,2-Trichloroethane	25	5.0	25	25	250	25
Trichloroethene	9	1.9	9	9	80	9
Trichlorofluoromethane	50	10.0	50	50	500	50
Vinyl Chloride	50	10.0	50	50	500	50
trans-1,3-Dichloropropylene	50	10.0	50	50	500	50



## DETECTION LIMITS FOR VOLATILE ORGANIC ANALYSES BY ETC

Trench #	7	14	25	26	27
Matrix	Water	Water	Water	Water	Water
Sample #	J0130	J0449	J0452	J0433	J0442
Acrolein	100.0	100.0	100.0	100.0	100.0
Acrylonitrile	100.0	100.0	100.0	100.0	100.0
Benzene	4.4	4.4	4.4	4.4	4.4
Bis(chloromethyl)ether	10.0	10.0	10.0	10.0	10.0
Bromoform	4.7	4.7	4.7	4.7	4.7
Carbon Tetrachloride	2.8	2.8	2.8	2.8	2.8
Chlorobenzene	6.0	6.0	6.0	6.0	6.0
Chlorodibromomethane	3.1	3.1	3.1	3.1	3.1
Chloroethane	10.0	10.0	10.0	10.0	10.0
2-Chlorovinyl ether	10.0	10.0	10.0	10.0	10.0
Chloroform	1.6	1.6	1.6	1.6	1.6
Dichlorobromomethane	2.2	2.2	2.2	2.2	2.2
Dichlorodifluoromethane	10.0	10.0	10.0	10.0	10.0
1,1-Dichloroethane	4.7	4.7	4.7	4.7	4.7
1,2-Dichloroethane	2.8	2.8	2.8	2.8	2.8
1,1-Dichloroethene	2.8	2.8	2.8	2.8	2.8
1,2-Dichloropropane	6.0	6.0	6.0	6.0	6.0
Cis-1,3-dichloropropene	5.0	5.0	5.0	5.0	5.0
Ethylbenzene	7.2	7.2	7.2	7.2	7.2
Methyl Bromide	10.0	10.0	10.0	10.0	10.0
Methyl Chloride	10.0	10.0	10.0	10.0	10.0
Methylene Chloride	2.8	2.8	2.8	2.8	2.8
1,1,2,2-Tetrachloroethane	6.9	6.9	6.9	6.9	6.9
Tetrachloroethylene	4.1	4.1	4.1	4.1	4.1
Toluene	6.0	6.0	6.0	6.0	6.0
trans-1,2-Dichloroethene	1.6	1.6	1.6	1.6	1.6
1,1,1-Trichloroethane	3.8	3.8	3.8	3.8	3.8
1,1,2-Trichloroethane	5.0	5.0	5.0	5.0	5.0
Trichloroethene	1.9	1.9	1.9	1.9	1.9
Trichlorofluoromethane	10.0	10.0	10.0	10.0	10.0
Vinyl Chloride	10.0	10.0	10.0	10.0	10.0
trans-1,3-Dichloropropylene	10.0	10.0	10.0	10.0	10.0

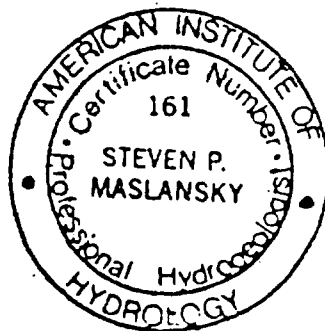
APPENDIX B

W.R. GRACE 1985 TRENCH INVESTIGATION

W.R. GRACE & CO., CRYOVAC DIVISION  
WOBURN PLANT

FIELD INVESTIGATIONS AND REMEDIAL MEASURES  
PHASE VI - FIELD DESCRIPTIONS

GeoEnvironmental Consultants, Inc.  
122 Saxon Woods Road  
White Plains, NY 10605



August, 1985

On July 1-4, 1985, 31 exploratory trenches or pits were excavated at the W.R. Grace/Cryovac Division property in Woburn, MA. The purpose of these excavations was to fulfill Phase VI of the Remedial Investigation Work Plan, dated June 25, 1985, and subsequently approved by the USEPA and other interested parties.

The following individuals participated or observed during the excavation process. Not all individuals were present at all times.

GeoEnvironmental Consultants, Inc.:	Steven Maslansky (OSC) Carol Maslansky Michael Ziskin
TRC Environmental Consultants, Inc.:	Curtis Kraemer
New England Pollution Control Co., Inc.:	Ronald Gould Jeffrey Magyar Richard Adinolfi Jay Brundage Warren Hevrin Gary Gilbo
Weston Geophysical Corporation:	Vincent Murphy John Imse Ben. Frothingham John Drobinski Mark Langston
NUS Corporation:	Kevin O'Neill Alan Angers
USEPA:	David Delaney
MultiVision:	Jay Heard Anthony Dolan Robert Goldsborough
W.R. Grace:	Mark Stoler
Other interested parties:	Jan Schlichtmann James Gordon Mark Phillips Kevin Conway Katherine Boyer

Equipment and personnel were mobilized on July 1, 1985. Staging, containment, and decontamination areas were prepared. Excavation equipment provided by New England Pollution Control Co. (NEPCO) included a Bantam backhoe with a 3/4-yd bucket; a Ford front-end-loader was made available on July 3, 1985.

Real-time air monitoring instruments included a Foxboro Century-128 Organic Vapor Analyzer (OVA), a Photovac TIP (TIP), and an HNU Systems Model PI-101 (HNU). These instruments were calibrated before use with 19ppm benzene. NUS personnel were equipped with an OVA. In addition, a MSA Samplair Pump with detector tubes for toluene, halogenated hydrocarbons (HHC) and aromatic hydrocarbons (AHC) were utilized.

Trench descriptions and pertinent findings are described. Actual instrument readings (ppm, calibration gas equivalent) were recorded and have not been corrected for ambient background. Trench locations and approximate sizes are indicated on the accompanying figures.

July 1, 1985, afternoon  
Clear, sunny, 70-76° F  
Trench 1,2,3,4,5

OVA: 2.4 ppm (Bkgrd)  
TIP: 2.0 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings(ppm)</u>
---------------------	---	----------------------

Trench 1

Slide:#1  
Sample:None  
Final dimensions 25x3x4.5 (ft, LxWxD).  
Located 12-15 ft from E wall of ware-  
house.

0.0-3.0 dk brown silty sand w/ gravel, OVA: 2.4  
small cobbles

3.0-3.5 layer of cobbles, boulders

3.5-4.5 moist dense sand w/ gravel, OVA: 2.0,2.4  
cobbles, boulders

Trench 2

Final dimensions 20x3x4.5.  
Located 12-15 ft from E wall of ware-  
house.

Slide:#2  
Sample:None  
0.0-4.5 dk brown silty sand w/ gravel, TIP: 1.6  
small cobbles; one piece metal debris OVA: 0.8  
at 2.0 ft.

Trench 3

Final dimensions 15x3x4.  
Adjacent to NE corner of warehouse.

Slide:#3  
Sample:None  
0.0-4.0 brown silty sand w/gravel, OVA: 0.5  
cobbles, small boulders. TIP: 0.0

Trenches 4&5

Final dimensions 10x3x3.5.  
Located 4-6 ft from E wall of warehouse.

Slide:None  
Sample:None  
0.0-3.0 brown silty sand w/ gravel, None  
cobbles

3.0-3.5 layer of cobbles

July 1, 1985, evening  
Clear, 67-73° F  
Trench 6,7

OVA: 2.0 ppm (Bkgrd)  
TIP: 0.5 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings(ppm)</u>
<u>Trench 6</u>		
<u>Slide:#4</u>	Final dimensions 20-25x3.5x5.5 Initiated at NE corner of warehouse, extended into pea gravel area.  0.0-2.0 brown sand w/ gravel, cobbles	
<u>Slide:#5,6</u>	2.0-3.0 layer of large cobbles, boulders, concrete debris. Midtrench, small metal disk noted.  3.0-5.0 brown silty sand w/ cobbles	OVA: 2.0,1.6
	5.0-5.5 at NW end of trench: soft, pliable, grey-green sludge	OVA: 2.0 TIP: 25.0
<u>Sample Soil</u> VOA,EXTR: J0136 <u>Sample Water</u> VOA:J0129	5.5-9.0 deepen trench only in area where sludge found; gray-brown moist silty sand. Water seepage noted at 7.5 ft. Soil and water samples collected.	
<u>Trench 7</u>		
<u>Slide:#7</u>	Final dimensions 40x3.5x Initiated by N wall of warehouse, adjacent to concrete apron.  0.0-0.3 black asphalt w/ red gravel base	OVA: 1.6 TIP: 2.0
<u>Slide:#8</u> <u>Sample</u> <u>Composit:</u> J0133	0.3-2.0 brown sand w/ gravel. Thin defined layer of gray-green paint sludge, hard, brittle, between 1.0-1.5 ft at mid-trench.  2.0-4.0 brown sand with cobbles, boulders	
<u>Slide:#9</u>	4.0-4.5 dense gray-brown silty sand. One piece metal debris found 6-12 ft from ware- house wall.	

July 1, 1985, evening  
Clear, 67-73° F  
Trench 7 (Continued)

OVA: 2.0 ppm (Bkgrd)  
TIP: 0.5 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings(ppm)</u>
---------------------	---	----------------------

Trench 7

Sample Soil	4.5-6.0 brown sand w/ gravel, cobbles. At	OVA: 710
VOA, EXTR:	midtrench, section of drainage pipe	
J0135	encountered. Readings taken in headspace	
Sample Water	within drainage pipe. MSA detector tube	
VOA: J0130	for TCE indicated 35ppm. Soil and water	
Sample Soil	samples collected from within pipe.	
Composit:		
J0137	North end of trench filled in, pipe at	
Slides:10-12	midtrench covered until 7/2/85 am.	

Note: The small quantities of paint residues and sludges encountered throughout the day were collected for off-site disposal.



July 2, 1985, morning  
Clear, 60-80° F  
Trench 7, 7A

OVA: 1-2.0 ppm (Bkgrd)  
TIP: 2.0 ppm (Bkgrd)  
HNU: 0.6 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings(ppm)</u>
---------------------	---	----------------------

Trench 7

Continued to investigate trench in area of drainage pipe, approximately 20 ft from warehouse wall.

Sample Soil Composit VOA: J0138 Slide:#13	1.0-3.0 auger holes punched into sides of trench. MSA detector tube for chlorinated hydrocarbons (CHC) indicated less than 5 ppm.	OVA: 10-11 TIP: 35
Sample Soil VOA, EXTR: J0139 Slide:#14,15	4.5-6.0 Soil around pipe excavated, silty sand, very moist to muddy.	OVA: 3.0
Sample Soil VOA,EXTR: J0140, Sludge VOA,EXTR:J0134 Sample Sludge VOA: J0453	5.0-6.0 Midtrench in area of drainage pipe, encountered small amount of yellow paint sludge. Soil with metal filings(3/4 yard) solvent odor detected.  5.0-6.0 Additional pipe uncovered, sludge within pipe.	OVA: 34-46 TIP: 20  OVA: 100 (peak)

Trench 7A

Slide:#16	Extended from midtrench of 7 for 10-15 ft in an attempt to follow path of drainage pipe.  Final dimensions 10-15x4.5x10.5  1.0-3.0 brown sand w/ gravel, cobbles; auger holes in trench walls. Detector tubes within holes indicated 35 ppm aromatic hydrocarbons (AHC), 200-400 ppm toluene.	OVA: off scale
Slide:#17 Sample Sludge Composit VOA EXTR: J0133	3.0-4.0 dark gray sand w/gravel, cobbles. Metal debris, some gray-green paint sludge encountered	OVA: 18 (peak)

July 2, 1985, morning  
Clear, 60-80° F  
Trench 7A (Continued)

OVA: 1-2.0 ppm (Bkgrd)  
TIP: 2.0 ppm (Bkgrd)  
HNU: 0.6 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Reading(ppm)</u>
---------------------	---	---------------------

Trench 7A

Sample Soil VOA: J0141	4.0-6.0 black, moist, silty sand	TIP: 30-40
Sample Water VOA: J0454 Slide: #18	8.3-10.5 horizon of brown sand; water seepage noted at 8.5 ft. Water in trench possibly contaminated w/ water and sludge from drainage pipe.	OVA: 6.0 HNU: 6.3

July 2, 1985, afternoon  
Clear, 76-80 F  
Trench 8

OVA: 2-3.2 ppm (Bkgrd)  
HNU: 0.5 ppm (Bkgrd)

Trench 8

<u>Slide:#19</u>	Final dimensions 45x3.5x5.0 Initiated adjacent to N wall of warehouse, E of Trench 7.	
	0.0-0.3 black asphalt w/ red gravel base	
	0.3-2.0 brown sand w/ gravel, cobbles	
<u>Slide:#20</u>	2.0-5.0 gr y-brown sand w/ some organic (natural) material. Metal debris excavated 10-12 ft from warehouse wall.	
	3.0 auger holes punched in trench walls 10-15 ft from warehouse wall.	OVA: 1-2
	3.0 holes in trench walls 20 ft from warehouse wall.	OVA: 28 (peak)
	4.0 holes in trench walls 20-25 ft from warehouse wall.	OVA: 200 (peak)
Sample Soil VOA: J0144	5.0 bottom of trench, 30-35 ft from warehouse wall. MSA detector tubes indicate 700+ ppm toluene, no CHCs.	OVA: 680 (peak)

July 2, 1985, afternoon  
Clear, 76-80° F  
Trench 8 (Continued), 9

OVA: 2-3.2 ppm (Bkgrd)  
HNU: 0.5 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings(ppm)</u>
---------------------	---	----------------------

Trench 8

<u>Sample Soil</u> VOA: J1438	1.5-4.0 auger holes punched in trench walls 30-35 ft from warehouse wall.	OVA: 400 (peak)
----------------------------------	---	-----------------

Trench 9

Slide: #21 Final dimensions 40x3.5x5.0  
Initiated E of Trench 8 adjacent to N wall of warehouse.

0.0-0.3 black asphalt w/ red gravel base

0.3-4.0 gray-brown sand w/ gravel, cobbles OVA: 2  
auger bore holes punched in sides of trench.

<u>Sample Soil</u> VOA: J0456	4.0-5.0 brown moist sand w/ gravel, cobbles. Auger bore holes approximately 30 ft from warehouse wall. Septic odor noted at approximately mid-trench, Level C respiratory protection worn in trench.	OVA: 8.5
----------------------------------	--	----------

5.0-7.5 gray-brown very moist, compact sand. Only area of trench 30-35 ft from warehouse wall deepened.

July 2, 1985, evening  
Clear  
Trench 10,11

OVA: 1-2.0 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings (ppm)</u>
---------------------	---	-----------------------

Trench 10

<u>Slide:#22</u>	Final dimensions 30x3.0x4.0 Initiated 10-15 ft N of Trench 9	
------------------	---	--

<u>Sample:None</u>	0.0-0.3 pea gravel w/ coarse sand to vegetation, dk brown loam w/ natural organic material as trench progressed from edge of asphalt into natural vegetation	
--------------------	--	--

0.3-4.0 brown moist sand w/ gravel, cobble	None above background
---	--------------------------

Trench 11

<u>Slide:None</u>	Final dimensions 35x3.0x3.0	
-------------------	-----------------------------	--

0.0-0.3 pea gravel, coarse sand w/ gravel	
--	--

0.3-2.0 gray-brown sand w/ gravel, few cobble.	OVA: 9.6
---	----------

<u>Sample Soil</u> VOA: J0457	1.0-1.5 midtrench, auger holes in trench walls.	OVA: 40,56
----------------------------------	--	------------

2.0-3.0 midtrench, auger holes in trench walls.	OVA: 30,52,60
--	---------------

3.0 midtrench, auger holes at bottom of trench.	OVA: 1.0,1.8
--	--------------

Note: The small quantities of paint residues and sludges encountered  
throughout the day were collected for off-site disposal.

July 3, 1985, morning  
Cloudy, 66° F  
Trench 12, 13

OVA: 2.0 ppm (Bkgrd)  
TIP: 0.3 ppm (Bkgrd)  
HNU: 0.9 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings(ppm)</u>
---------------------	---	----------------------

Trench 12

Slide:#23

Final dimensions 45-50x4.0x4.0'  
Trench 12 transected Trenches 7,8 and 9  
which had been previously excavated and  
backfilled.

Sample:None

0.0-0.3 black asphalt w/ red gravel base  
to pea gravel w/ coarse sand.

0.0-2.0 brown sand w/ gravel, cobbles.  
Auger bore holes in trench sides

TIP: 1.8,4.2  
OVA: 2.0  
HNU: 0.4,2.8

2.0-4.0 gray-brown moist silty sand w/  
gravel, cobbles, few boulders

OVA: 2.0  
TIP: 1.8

Trench 13

Slide:24

Final dimensions 25x3.5x4.0'  
Trench 13 transected Trenches 7, 7A and  
8 which had been previously excavated  
and backfilled.

OVA: 1.0,1.6  
HNU: 0.7

Western section of trench, area transected  
by Trench 7, 7A excavation and backfill:

0.5-1.0 gray-brown moist silty sand with  
metal filing, cobbles, small boulders.

OVA: 2.8  
TIP: 0.3

Sample Soil  
VOA: J0458

1.0-4.0 gray-brown sand fill w/ gravel,  
cobbles, boulders. Instrument readings  
within auger holes variable, increasing  
w/ proximity to area where drainage pipe  
had been located.

OVA: 2.2,2.8,  
9.0, 20  
(peak),70

Eastern section of trench, area transected  
by Trench 8 excavation and backfill:

0.0-4.0 gray-brown sand fill w/ gravel,  
cobbles, boulders. Auger bore holes made  
in sides of trench.

OVA: 35  
TIP: 3.7

4.0 auger holes in bottom of trench

OVA: 7.8,1.4

July 3, 1985, morning  
Cloudy, 66° F  
Trench 14

OVA: 2.0 ppm (Bkgrd)  
TIP: 0.3 ppm (Bkgrd)  
HNU: 0.9 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings (ppm)</u>
---------------------	---	-----------------------

Trench 14

Slide:#25,26 Final dimensions 50x5.0x6.0  
Trench 14 transected Trenches 6,7,7A,8  
and 9 which had been previously excavated  
and backfilled.

0.0-3.0 brown moist sand fill w/ gravel,  
cobble. OVA: 2.0  
TIP: 1.6  
HNU: 0.6

3.0-4.0 moist gray-brown sand w/ gravel,  
few cobbles

Slide:#27 4.0-5.0 rusty brown peat-like soil with  
natural organics, several large boulders OVA: 1.4

Slide:#28 5.0-6.0 brown moist sand w/ gravel; gray  
green rubbery sludge material, several  
pieces of metal All: 5-10

In area between Trenches 6 and 9:

3.0-4.0 gray silty sand underlain w/  
brown peat w/ natural organics OVA: 5.0  
TIP: 4.6

Sample Soil 4.0-5.0 gray-black granular soil w/  
VOA: J0447 green discoloration, paint sludge also  
Sample Sludge noted OVA: 3.5  
VOA, EXTR: TIP: 4.6  
J0125 HNU: 7.0

4.0-5.0 auger holes in sides of trench OVA: 115 (peak)  
TIP: 100 (peak)  
HNU: 140 (peak)

In area proximal to Trenches 7,7A and 8:

Sample Soil 5.0-6.0 gray moist silty sand w/ gravel, All: 100+  
VOA: J0448 cobble fill. Auger holes in side and  
bottom of trench. Level C respiratory  
protection worn in trench. MSA detector  
tubes for toluene decreased from 625 ppm  
to 80 ppm to no more than 10 ppm within  
a 6-8 ft area. AHC tube indicated 100-300  
ppm, HHC tubes indicated 5-20 ppm. Metal  
filings and yellow-orange rubbery sludge  
re-encountered.

July 3, 1985, afternoon  
Cloudy, brief rain episode, 75° F  
Trench 14 (Continued), 16-18

OVA: 1.0 ppm (Bkgrd)  
HNU: 0.6 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings(ppm)</u>
---------------------	---	----------------------

Trench 14

<u>Sample Water</u> VOA: J0449	6.0-9.5 excavation continued only in area coinciding with increased instrument and detector tube readings. Gray-black sludge like material with asphaltic appearance encountered. Two drums of gray-black material considered contaminated (50+ ppm peak value, measured within 6-inches of sample) were collected, dried w/ Trench 30 material. Water seepage noted at 9.5 ft.	
-----------------------------------	---	--

Trench 16

<u>Sample:None</u>	Final dimensions 40x3.0x3.0	
<u>Slide:None</u>	0.0-0.3 black asphalt w/ red gravel base	
	0.3-3.0 very dense gray-brown silt and sand w/ gravel, few cobbles, few boulders.	OVA: 1.0

Trench 17

<u>Sample:None</u>	Final dimensions 20x10x3.0	
<u>Slide:None</u>	0.0-1.3 medium dense moist brown loam	None
	1.3-3.0 very dense moist brown sand w/ gravel, few cobbles	

Trench 18

<u>Sample:None</u>	Final dimensions 25-30x3.0x2.5	
<u>Slide:None</u>	0.0-1.3 medium dense moist brown loam	HNU: 0.6
	1.3-2.5 dense moist brown sand w/ gravel, cobbles	

July 3, 1985, afternoon  
Cloudy, 75° F  
Trench 19-22

OVA: 1.0 ppm (Bkgrd)  
HNU: 0.6 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings(ppm)</u>
---------------------	---	----------------------

Trench 19

<u>Sample</u> :None	Final dimensions 10-12x3.0x2.5	
<u>Slide</u> :None	0.0-1.3 medium dense moist dk brown loam	None
	1.3-2.5 dense moist brown sand w/gravel, cobble	

Trench 20

<u>Sample</u> :None	Final dimensions 60x3.5x2.5	
<u>Slide</u> :#29	0.0-2.0 dense fine gray silty sand	None
	2.0-2.5 dense brown sand w/ gravel, cobble	

Trench 21

<u>Sample</u> :None	Final dimensions 20-25x3.0x2.5	
<u>Slide</u> :None	0.0-0.5 dense gray silty sand	
	0.0-2.5 dense moist brown sand w/ gravel cobble, natural organic material	OVA: 1.6, 2.0

Trench 22

<u>Slide</u> :#30	Final dimensions 25-30x3.0x3.0	
<u>Sample</u> :None	0.0-0.5 medium dense moist brown loam	
	0.5-3.0 dense moist brown sand w/ gravel, cobble; one empty cold cream jar, one small piece metal debris encountered midtrench.	OVA: 2.0



July 3, 1985, evening  
Partly cloudy  
Trench 23,24

OVA: 1.6-2.0 (Bkgrd)  
HNU: 0.6 (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings(ppm)</u>
---------------------	---	----------------------

Trench 23

Slide:#31

Final dimensions 30x3.0x4.0

0.0-0.5 medium dense, moist brown loam

0.0-2.0 moist brown sand w/ gravel,  
cobbles

Slide:#32

2.0 at NW end of trench, 1/2 by 8-inch OVA: Bkgrd  
layer of green paint-like material adhering  
to surface of several rocks as well as  
soil particles.

Sample:None

2.0-4.0 area with green paint extended,  
no additional paint or sludge found; one  
small rusted can, one tattered plastic bag  
uncovered. Widened area of trench 6x10x4

Trench 24

Slide:#33

Final dimensions 25-30x3.0x3.0

0.0-0.5 medium dense, moist brown loam

0.0-2.0 moist light brown sand w/  
gravel, cobbles; two metal straps  
encountered

Slide:#34

2.5 3-inch lens of light tan fine sand OVA: 1.6,2.0

2.5-3.0 very dense moist brown sand w/  
gravel, cobbles

July 3, 1985, evening  
Partly cloudy  
Trench 25

OVA: 1.6-2.0 ppm (Bdgr)  
HNU: 0.6 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings (ppm)</u>
---------------------	---	-----------------------

Trench 25

Final dimensions 8-10x4.0x10

0.0-0.5 dense moist brown loam

0.5-4.0 dense moist brown sand w/ gravel and cobbles	OVA: 2.0 HNU: 0.6
--	----------------------

4.0-7.0 compact gray silty sand w/ gravel, cobbles; aromatic odor noted	OVA: 8.0, 2.0
---	---------------

7.5 water seepage noted

Sample Water VOA, EXTR: J0126	8.0-10 wet gray silty sand w/ gravel, cobbles; water collecting in trench	OVA: 11.0 HNU: 9.0
-------------------------------------	---	-----------------------

Slide: #35	Schedule 40 PVC pipe (2-inch diameter) positioned in trench, designated <u>Well 6A</u> ; trench left open overnight.
------------	--

Sample Water VOA: J0452	Standing water in trench re-sampled on July 4, 1985, morning; oily sheen, aromatic or phthalate odor noted.
----------------------------	---

Trench 25 backfilled, 6-hours after filling, headspace in Well 6A sampled. TIP bkgrd 2.3 ppm.	TIP: 17.6 (peak)
--	------------------

Note: The small quantities of paint residues and sludges collected throughout the day were collected for off-site disposal.

July 4, 1985, morning  
Clear  
Trench 26

OVA: 2.0 ppm (Bkgrd)  
HNU: 0.2 ppm (Bkgrd)  
TIP: 2.3 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings(ppm)</u>
---------------------	---	----------------------

Trench 26

<u>Slide:None</u>	Final dimensions 20x4.0x7.5	
-------------------	-----------------------------	--

0.0-0.5 dense moist brown loam

0.5-7.5 dense light-brown sand w/  
gravel, many cobbles, few boulders

<u>Sample Water</u> VOA: J0443	7.5-9.5 moist grey silty sand; water seepage noted at 7.5 ft, interface of cobble till and sand	
-----------------------------------	---	--

OVA: 2.0  
HNU: 0.2

Trench 27

<u>Slide:None</u>	Final dimensions 20x4.0x9.0	
-------------------	-----------------------------	--

0.0-0.5 dense dk brown loam

0.5-5.0 coarse brown sand w/gravel,  
few cobbles

HNU: 0.2

5.0-6.0 brown sand w/gravel

<u>Sample Water</u> VOA: J0442	6.0-9.0 brown sand w/gravel, many cobbles; water seepage noted at 6.0- 6.5 ft, interface of cobble till and sand. Water collecting in trench.	
-----------------------------------	--	--

HNU: 0.3

Schedule 40 PVC pipe (2-inch diameter)  
positioned in trench, designated Well  
6B.

July 4, 1985, morning  
Clear  
Trench 28,29

OVA: 2.0 ppm (Bkgrd)  
HNU: 0.2 ppm (Bkgrd)  
TIP: 2.3 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings(ppm)</u>
---------------------	---	----------------------

Trench 28

Initial dimensions 8-10x4.0x8.5, extension  
dimensions 40-45x3.0x3.0

0.0-0.5 dense moist dk brown loam

0.5-3.0 moist brown sand w/ gravel

3.0-7.0 moist brown sand w/gravel,  
cobbles, few boulders

Sample Water  
VOA J0444

7.0-8.5 dense moist gray silty sand;  
water seepage noted at 8.5 ft

OVA: 1.2

Slide:#36

Trench extended 40-45 ft to a depth  
of 3.0 ft; soil profile same as above.

Trench 29

Slide:None

Final dimensions 10x3.0x3.0

Sample:None

0.0-0.5 dense moist dk brown loam

None

0.5-3.0 moist brown sand w/ gravel,  
few cobbles

Trench 30

Final dimensions 20x20x12 (maximal  
depth 12ft at center of pit)

OVA: 0.6

HNU: 0.6

TIP: 2.3

0.0-0.5 dense moist brown sandy loam

0.5-3.0 dense brown sand w/ gravel,  
cobbles, initial trench 8x8x3. Small  
layer of green sludge noted at 3 ft,  
sludge thickness 2-3 inches..

Slide:#37

Excavation continued in attempt to  
locate additional sludge layers

July 4, 1985, afternoon  
Clear, 76° F  
Trench 30 (Continued), 31

OVA: 0.6 ppm (Bkgrd)  
HNU: 0.6 ppm (Bkgrd)  
TIP: 2.3 ppm (Bkgrd)

<u>Sample/Slide</u>	<u>Depth(ft)/Description of Trench/Comments</u>	<u>Readings(ppm)</u>
	3.0-4.0 dense tan sand w/ few cobbles	
	4.0-5.0 moist brown sand w/ gravel, cobbles	
<u>Slide:#38,39</u>	5.0-8.0 pit center deepened; moist gray-brown sand w/ gravel, few cobbles	
<u>Sample Soil</u> <u>VOA,EXTR:</u> Jl440	8.0-10 gray moist silty sand, aromatic odor noted. Instrument readings from excavated material indicated rapid air-stripping.	All: 100-700 (peak) TIP: 1500 (peak)
<u>Sample Soil</u> <u>VOA,EXTR:</u> Jl442	10-12 gray moist silty sand, no odor noted. Instrument readings rapidly declined as depth and width of pit increased.	All: 10-50 (peak)
	12.0 excavated material gray-brown silty sand, no odor	OVA: 2.0 TIP: 5.0
	Moist excavated material allowed to dry for several hours, material spread and turned periodically to facilitate drying. No additional sludge, no metals detected; peak instrument readings 6-inches above excavated soil were below 15 ppm prior to backfilling.	TIP: 5-15

#### Trench 31

<u>Slide:#40</u>	Final dimensions 12-15x3.5x8.0	None
	0.0-0.5 dense moist brown sandy loam	
<u>Sample Soil</u> <u>VOA,EXTR:</u> Jl439	0.5-7.0 moist brown sand w/ gravel, cobbles, boulders	
	7.0-8.0 dense moist gray sand w/ gravel; water seepage noted at 7.0 ft, interface of cobble till and sand	

Note: The small quantities of paint residues and sludges encountered during day were collected for off-site disposal.

1 STY. BRICK BUILDING

369 WASHINGTON ST

10 FLR.  
98.08

12"

CONC

DMH  
R: 97.00  
1: 91.20 (W)  
1: 91.10 (S)

CLF

GATE

X 9795

X 9795

X 9795

CONC  
PAD

FINISHED FLR  
ELEV = 97.59

1 STY.  
METAL  
BLDG.

Positions of Trenches  
1 - 11

STK 59

WIRE FENCE

97.0

STK 510

G6

DB  
G10S  
G10D

96.8

94.8

96

94.7

96.6

95.6

94

94

12"

92.28

G7D

G7S

3

2

1

5

4

93.7

94

94.6

94.9

95.8

94.7

97.0

STK 54

95

94

97

92.8

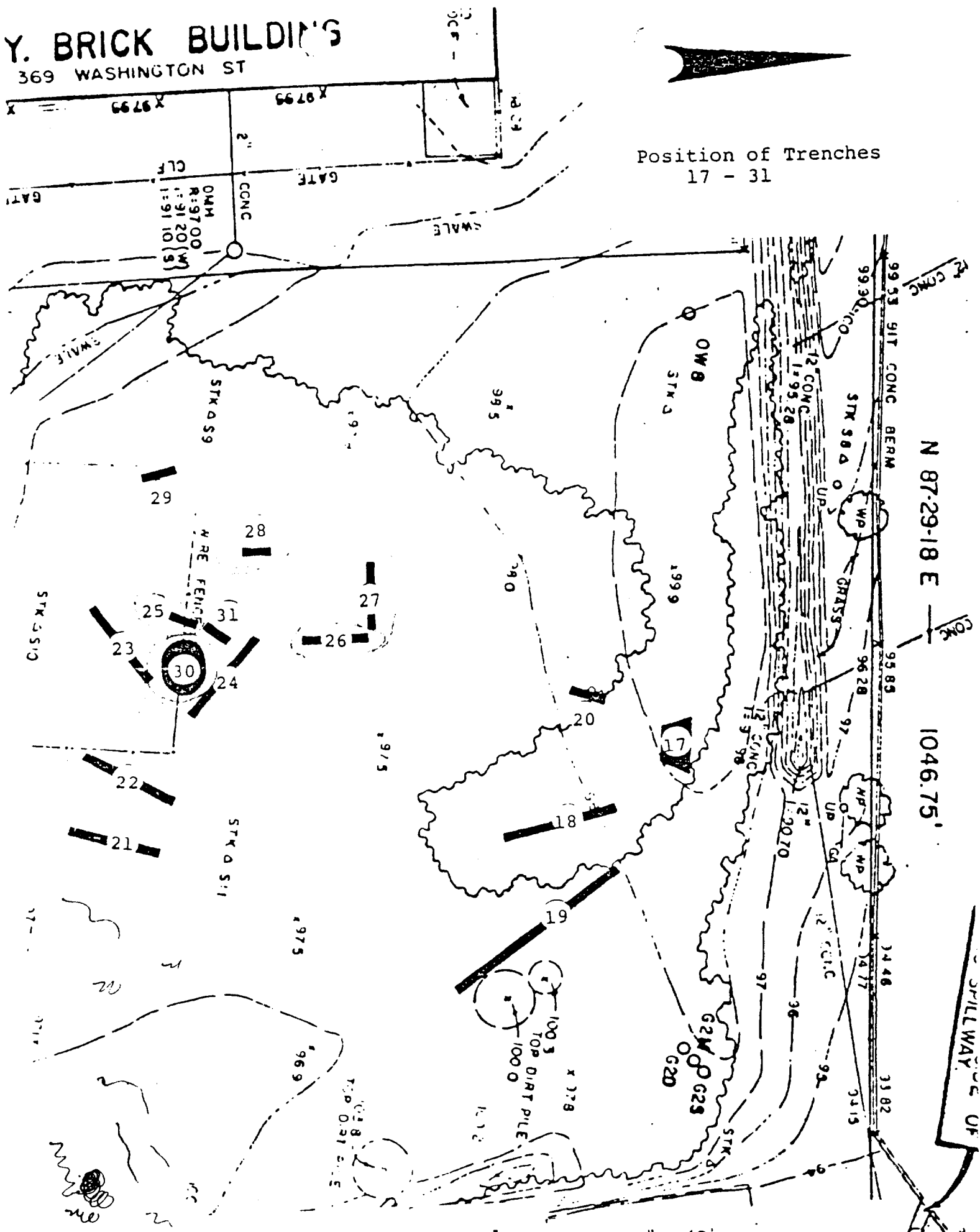
3" W

SCALE 1" = 40'

METERS 0 5 10 20

369 WASHINGTON ST

Position of Trenches  
17 - 31



1 STY. BRICK BUILDING  
369 WASHINGTON ST

D FLR.  
38.08

CONC  
PAD

FINISHED FLR  
ELEV = 97.59

1 STY.  
METAL  
BLDG.

Positions of Trenches  
12 - 16

STK 51

WIRE FENCE

STK 510

G6

DB  
G10S  
G10D

96.8

94.7

96.6

95.6

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

94

SCALE 1" = 40'